

# METRONET YANCHEP RAIL EXTENSION

Yanchep Train Station



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**Summary of METRONET YRE Project and Yanchep Station** 

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# INTRODUCTION

Urbis acts as the planning consultant on behalf of the Public Transport Authority (PTA) and the *NEWest Alliance*, the contractor to complete works on the METRONET Yanchep Rail Extension (YRE). The following development application seeks approval for the Yanchep train station and associated infrastructure, which is one of three new train stations proposed as part of the METRONET YRE, which will result in the extension of the Joondalup line from Butler to Yanchep.

The Yanchep Train Station is the 'end of line' station for the Joondalup train line, which will culminate within the core of the Yanchep Strategic Metropolitan Centre, located generally in the area bounded by Toreopango Avenue, Yanchep Beach Road, Marmion Avenue and Wanneroo Road. The Yanchep Station is within the municipality of the City of Wanneroo.

The Yanchep Station is recognised as an essential catalyst for the successful development of the Yanchep Strategic Metropolitan Centre. The station will unlock the potential to implement a contemporary town centre within the heart of Yanchep, including the opportunity to support higher density development within this important northern centre, without creating sole reliance on the private vehicle. This 'infrastructure first' model of development enables the town centre to be defined by the railway station from day one and ensure that movement and built form is defined holistically to the magnetism of the railway station.

The Yanchep station is a 'multi-modal' station, and will broadly comprise the following:

- The rail line sunk within a rail cutting and capped by the main station building and adjoining station plaza open space. The station building is designed as a 'cut and cover' station, meaning the railway tracks and station platform are partially sunk below ground level, creating an at-grade entry experience to the station concourse. This station design serves the dual purpose of improving the pedestrian experience into the station, as well as meet the PTA's safety requirement of delivering pedestrian access which does not directly interface with the rail infrastructure.
- The station building, which is designed with three entry points at the east, south and west facades of the building. This station entry arrangement is unique to the Yanchep station, and has been implemented to provide a continuous east-west movement between the city centre core, as well as direct access station plaza located immediately south of the Yanchep station building.
- The station plaza open space immediately south of the station building. This open space is an important component in forming a seamless east-west link over the railway line, connecting both sides of the future Yanchep activity centre. The station plaza open space will function as a central meeting point for the future activity centre, and incorporates high quality paving and planting.
- Bus interchange immediately south east of the station entrance. The intent behind this design is to
  provide additional activation and surveillance over this public space, as well as maximising the
  convenience of the bus-to-train travel. A weather protected link is provided between the bus
  interchange links, station plaza open space and the station entrance.
- Principal shared path (PSP) to the western side of the railway line, which terminates at the station
  plaza open space. This PSP will ultimately form part of a wider connection generally running parallel
  to the Yanchep Rail Extension railway reservation.
- Private vehicle parking, including a dedicated 'kiss-and-ride' area and separate long-term parking area designed for Transperth 'park-and-ride' patrons.

A key objective in the station design is to apply principles which support transit orientated development (**TOD**), encourage non-private vehicle use for connecting trips, and support a diverse range of complementary uses within the activity centre. However, the pragmatic requirement for long-stay car parking for a new train station within an emerging town centre must still be acknowledged, and provided for in a way that is safe and does not overly impact the long-term placemaking opportunity. To strike an appropriate balance between these competing objectives, the following infrastructure hierarchy has been specifically applied to the station design:

 Pedestrian permeability and desire lines and accessibility have been key drivers in the station design. The station plaza open space forms a key piece of the station connection, as it provides an at-grade and unencumbered connection to the station concourse, and assists in unifying the activity centre.

- Bus service convenience, with the bus interchange being located immediately adjacent to the station entrance. Passenger comfort is considered in the design, with weather protection provided between the station and bus interchange.
- Drop-off and pick-up ('kiss-and-ride') area within a short walk of the station entrance, which also provides for on-demand transport options; and
- Long-stay (all day commuter) parking is provided north-west of the station, at the greatest distance from the station entrance.

This hierarchy encourages patrons to consider private car alternatives by delivering these as 'active modes' in the most convenient locations within the design. Future development parcels have also been set-aside by the interfacing private land developer immediately south of the car parking area. This is a deliberate measure which is intended to encourage Transperth 'park-and-ride' patrons to consider a pathway through the town centre to access the station, encouraging users to combine trips such as day-to-day household shopping provisions.

The Yanchep Train Station has also benefitted from detailed pre-lodgement design review conducted by the State Design Review Panel (**SDRP**), consistent with the required process of State Planning Policy No. 7 – Design of the Built Environment. This review process has resulted in an exceptional architectural design for the station building, as well as placement of the station within the future activity centre layout.

The Yanchep Station achieves the appropriate balance of applying best practice station design whilst also addressing the requirements of a major train station in an emerging urban setting. Overall, the YRE sets out to transform the travel patterns of the emerging north-west metropolitan corridor, reducing the traditional reliance on a private vehicle for travel. The YRE alignment and all supporting stations have been the subject of in-depth community and stakeholder engagement, which has culminated in the creation of a unique station precinct for each new station.

This report considers the planning context and merit of the proposed development and provides an assessment of the application against the relevant planning framework, including the requirements of SPP 7 and the METRONET Station Precinct Design Guide.

# 1. PROJECT BACKGROUND

## 1.1. YANCHEP RAIL EXTENSION BACKGROUND

METRONET is a key project of the State Government and the single largest investment in public transport ever undertaken in Perth and will positively change how people live and travel in Perth.

The METRONET Yanchep Rail Extension (**YRE**) project will deliver a 14.5km rail extension of the Joondalup Line from Butler Station to Yanchep. The project includes the delivery of 3 new stations at Alkimos, Eglinton and Yanchep, a new bus stowage depot at Alkimos, 9 new road-over rail bridges, 13.8km of dual-use principle shared path (PSP) and converting Butler Station into a 'through' station.

A context summary of the YRE extension is illustrated at Figure 1.

Figure 1 - Context Summary of YRE Extension

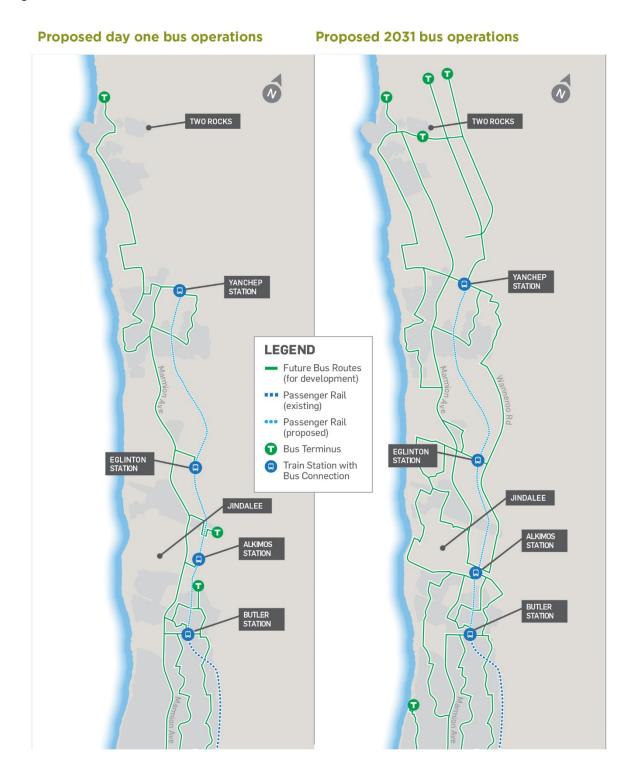


Early estimates of the YRE patronage estimates that around 5,200 daily boarding's will occur at day one operation, with this number drastically increasing to an estimate of approximately 19,400 daily boarding's by 2031.

Peak period operation of the YRE extension of the Joondalup line is expected to require six carriages operating at a frequency of 6 trains per hour (averaging one train per 10-minute intervals).

All new stations delivered as part of YRE are designed as multi-modal stations meaning the train station will be delivered in conjunction with supporting transport infrastructure including bus interchange, pedestrian and cyclist paths and connection to the road networks. Figure 2 below outlines the planned bus network to be implemented in conjunction with the YRE line, noting that the network is ultimately dependent on multiple variables such as supporting local road constructions by surrounding land developers and associated infrastructure funding arrangements. As a result, these bus networks may be subject to change.

Figure 2 - Planned YRE Bus Network



Source: METRONET YRE Project Definition Plan

A summary of the METRONET YRE project is provided at **Appendix A** of this report.

# 1.2. YANCHEP STATION BACKGROUND

Patronage estimates used to inform the planning of the Yanchep Station suggests that approximately 4,000 to 5,000 daily boardings will occur at the station's commencement, and between 8,000 and 9,000 daily boardings will be undertaken by 2031. The new station and rail extension provides an alternative to the 1 to 1.5hr private vehicle peak hour journey to the Perth CBD, reducing the journey to approximately 49 minutes,

providing direct and measurable incentives for commutes to consider public transport over private vehicle use.

## 1.3. METRONET CONTRACT BACKGROUND

The contractual arrangements under METRONET for the YRE project are structured as an 'alliance-style contract'. In December 2019, the NEWest Alliance was formed and selected as the contractor to deliver the YRE project, including the Yanchep Station and associated 'land-side' station infrastructure development.

As the YRE is a METRONET project, the funding for the project has been allocated by the State and Federal Governments, with the scope of the project being approved by Parliament of WA in the form of a Project Definition Plan. The scope of the project is captured within the contractual arrangements, including the METRONET specified Scope of Work and Technical Criteria (**SWTC**). This SWTC also sets the design criteria, standards and guidelines for the station design.

For the Yanchep Station specifically, the SWTC sets out the following direct design parameters relevant to the scope of this development application:

- Delivery of the station building, including two station platforms and all internal operational facilities, servicing and amenities.
- Station platform, which is 150 metres long and will cater for 6 car train sets below the station concourse. The station platforms must provide weather protection to 50% of the platform length.
- Bus interchange with at least 14 active bus stops (12 rigid and 2 articulated bus bays) and 7 bus layover bays, and associated infrastructure including bus roads, pedestrian access pathways, bus canopies and waiting areas.
- Two secure bicycle parking shelters and separate u-rails adjacent to the station entry points.
- Landscaping to streets, forecourts and public open space on the PTA controlled land.
- Parking bay numbers, including the number of long-term 'park-and-ride' bays, accessible, taxi, electric car and motorcycle / scooter bays, and separate drop-off (kiss-and-ride) parking area.

Importantly, the SWTC also sets key qualitative station design measures, such as:

- The requirement to deliver a multi-modal transport hub with bus interchange and rail station. This included a specification that the bus interchange includes a continuous canopy shelter between the bus interchange and rail entrance.
- The need for the station to be located centrally to the main retail, commercial and residential areas of the future Yanchep Strategic Metropolitan Centre, and easily accessible to those users who rely on public transport.
- The requirement for pedestrian access to the station to be at concourse level, and forming a connection over the new rail line from both east and west of the station, including the ability to freely move through the station concourse (i.e. no fare gates) as a means of passing through the activity centre.

This SWTC therefore sets the basic building blocks for the delivery of a highly functional and contemporary multi-modal train station. The role of the NEWest Alliance is to interpret these requirements and apply them to the detailed station design, as proposed through this development application.

The station development envelope is also strictly defined by a number of factors, including landowner negotiations and environmental constraints, such as the clearing of significant vegetation and associated environmental offsets.

In terms of the development approvals process, this essentially means that there are some fixed aspects to the project, and as a result there are limitations on the ability to make fundamental changes to the design scope and requirements. However, the opportunity to make pragmatic changes which remain within the scope of the SWTC and environmental approvals may still be considered.

# 2. SITE LOCATION AND CONTEXT

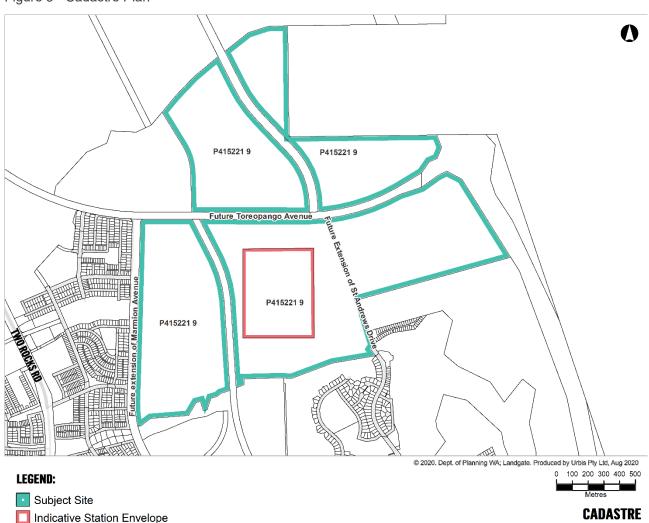
# 2.1. SITE PARTICULARS

The legal details of the lots directly affected by works for the Yanchep Station are set out in Table 1. Certificates of Title are enclosed within this application at **Appendix B**.

Table 1 Affected Lots (Yanchep Station)

Lot	Street Address	Plan	Vol/Folio	Proprietor
9	146K Toreopango	P415221	2959/378	St Andrews Private Estate Pty Ltd
	Avenue, Yanchep		2959/379	New Orion Investments Pty Ltd
			(Multi-title lot)	

Figure 3 - Cadastre Plan



## 2.2. SITE CONTEXT

The Yanchep Station is proposed within the centre of the planned Yanchep Strategic Metropolitan Centre approximately 60km north of the Perth CBD, which is an emerging activity centre currently being progressed by the landowner Yanchep Beach Joint Venture, whom have recently received approval for a superlot subdivision to progress the construction of primary roads (refer to Section 3.2).

Eglington and Alkimos are the closest activity centres to Yanchep, which are identified as 'District Centre' and 'Secondary Centre' respectively in accordance with the activity centre hierarchy specified in *State Planning Policy No. 4.2 – Activity Centres for Perth and Peel.* Accordingly, the Yanchep Strategic Metropolitan Centre will be the highest order centre of the three new stations delivered as part of the YRE project, and will function as the main regional activity centre for the emerging north west corridor.

As illustrated in Figure 4 below, the Yanchep Station and surrounding land is currently undeveloped.

Figure 4 – Current Aerial Photo

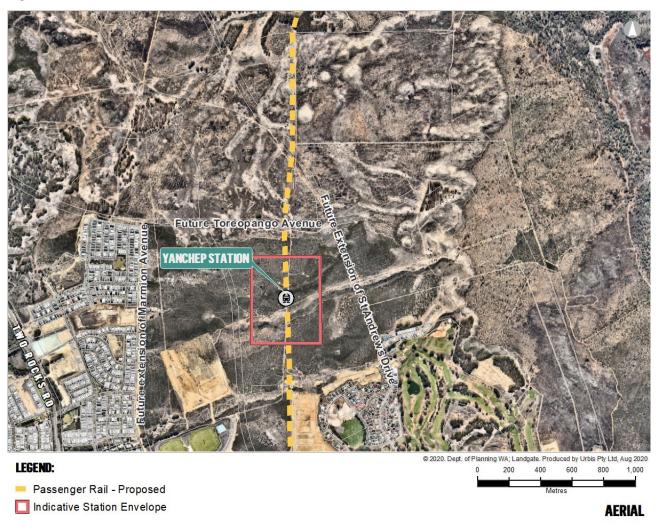


Figure 5 - Context Reference Plan

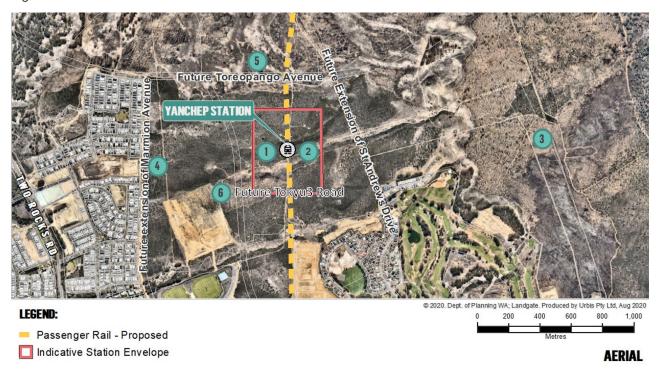


Figure 5 and Table 2 below provides detailed information on the immediate contextual considerations that are directly applicable to this application.

Table 2 Context Summary

CONTEXTUAL FEATURE	DETAILS
Future Yanchep Activity Centre (West of Railway)	The Yanchep Activity Centre Plan identifies the area immediately west of the station within 'Precinct 1 – City Centre Core' including priority pedestrian route and main street connecting east-west to the station entrance. This western edge contains the majority of this centre core, indicating that this will be an area of the activity centre with the highest levels of street activation and pedestrian activity.
Future Yanchep Activity Centre (East of Railway)	East of the railway also remains within the 'Precinct 1 – City Centre Core' under the Yanchep Activity Centre Plan, but with the notable difference of not providing the main street connection. Prioritisation of pedestrian movements in this area is still a key priority, but the exclusion of the main street element suggests that this area is best used for functions which are secondary to a main street, but still supportive of a pedestrian centric environment.
Future Mitchell Freeway Alignment	The Mitchell Freeway extension is planned to align approximately 1.5km east of the Yanchep Train Station, with an intersection connection point planned at Toreopango Avenue and/or Yanchep Beach Road.
	Main Roads funding for the freeway extension is currently limited to construction up to Romeo Road in Alkimos. As a result, this development application has not modelled the Mitchell Freeway extension as part of the Yanchep Station traffic modelling and assessment.

CONTEXTUAL FEATURE	DETAILS
Future Marmion Avenue Alignment	Marmion Avenue is identified as an 'Integrator Arterial 'A' Road under the road hierarchy of the Yanchep Activity Centre Plan, and an 'Other Regional Road under the MRS. This suggests that Marmion Avenue will be a vehicle orientated carriageway and relatively high speed environment.
Future Toreopango Avenue Alignment	Toreopango Avenue is planned to be constructed approximately 500m north of the Yanchep Station. Toreopango Avenue is a 'Other Regional Road' reservation under the MRS, and identified as a 'Integrator Arterial 'A' Road under the road hierarchy in the Yanchep Activity Centre Plan, suggesting this will also function as a vehicle oriented road and higher speed environment.
Future Tokyu3 Road	The future Tokyu3 road will provide an east-west connection between the extended Marmion Avenue and St Andrew's Drive. Tokyu3 is identified as a 'Major City Street' under the Yanchep Activity Centre Plan.  Subdivision approval to facilitate the construction of Tokyu3 was granted to the landowner Yanchep Beach Joint Venture in May 2020 (WAPC ref. 158629), with construction of the road expected to be complete for Day 1 Operation of the Yanchep Station. Further information is provided in Section 3.2.1 of this report.

# 3. PROPOSED WORKS

The delivery of the Yanchep Station provides existing and future residents nearby with local rail and bus services, working towards the State Government's objectives to increase the reach and frequency of bus and rail services, alleviate road demand, and provide alternative and sustainable transport options to residents of Perth.

Consistent with the METRONET ethos, the Yanchep Station will incorporate a number of built form and placemaking initiatives designed to encourage alternative forms of transport to and from the station, discourage anti-social behaviour, create a 'sense of place', and implement natural wayfinding cues leading to the station entrance. The guiding principle for the station design is to deliver a functional, long lasting asset to the State at the greatest value for money and lowest whole of life cost. The following information demonstrates what is proposed for the Yanchep Station, and most importantly how the Yanchep Station meets these objectives.

## 3.1. STATION WORKS

The station has been designed as a 'cut and cover' station as it passes through the Yanchep Activity Centre, meaning that the station concourse is constructed at ground level, and the station platform will be sunk at a lower level. This station design maximises patron usability, and allows direct and level access to the train station forecourt from the surrounding area. This acts to eliminate the railway as a barrier to the free movement of pedestrians from one side of the railway line to the other.

The specific works proposed by this development application include the following:

- The station building, with station entrances provided to the west, east and south building elevations.
- Two station platforms of 150m length, with a canopy roof cover for 60% (approx. 90m) of each of the station platforms, with this weather protection being provided at the area of highest passenger activity. Each platform has two lifts, two escalators and one set of stairs.
- A bus interchange operating in an anti-clockwise direction, which includes 14 active bus stands for passenger pick-up/drop-off. The busway also contains 7 layover bus bays, allowing buses to park between services, and quickly recirculate as required.
- A grade separated Principle Shared Path (PSP) located along the western side of the station, which terminates at the station forecourt. This is the end of the line for the 13.8km PSP extension of the PSP from Butler to Yanchep.
- Two secured bicycle shelters, located south west of the station building adjacent to where the PSP path terminates. These shelters are designed with two tier bicycle storage (typical of contemporary PTA bike stores), and provides capacity to park up to 96 bicycles each. Five u-rails are also provided immediately adjacent to the east and west station entrances respectively.
- Parking including a short-term parking and 'kiss 'n' ride' area, and long-term parking bays located north west of the station for passengers and PTA staff containing 995 bays.

Development plans for the proposed station works are provided at **Appendix C** of this report.

# 3.2. SUPPORTING WORKS (NOT SUBJECT TO THIS APPLICATION)

Given the greenfield context of the YRE extension, the new stations will logically require a substantial component of infrastructure to support functional operation. For the Yanchep Station, this will require a number of road connections to be completed by the third party landowners / developers, as well as works which are exempt from the requirement of planning approval generally.

The following section outlines these supporting works, and the associated arrangements which are in place for the Yanchep Station.

## 3.2.1. Road Bridges and Road Network

The scope of the METRONET project will also include the completion of certain works and infrastructure to be funded by the landowner / developer (being Yanchep Beach Joint Venture (YBJV)), but constructed by NEWest Alliance under the project SWTC. For the Yanchep Station, this will include the following:

- Tokyu 3 Road Bridge (south of station);
- Yanchep Beach Road Bridge; and
- Toreopango Avenue Bridge.

Tokyu 4 Road Bridge (north of station) is also identified as a potential future bridge, but this is not included within the scope of works for the YRE. Any required approvals and construction of this bridge will be the responsibility of the landowner.

Consultation with the METRONET office was undertaken in the early stages of this development application process, where it was determined that these bridges would not require development approval on the basis that they did not provide direct vehicle access into the station. The exemptions from planning approval available for this METRONET project is further detailed within Section 7.3 of this report.

Regardless of this exemption, it was agreed that a basic level of information for these structures should be provided within the development application report, for context only and not part of the formal approval documentation.

A summary of the detail for these surrounding works which will ultimately support the Yanchep Station are presented in Table 3 below. Early designs of these road bridges are provided at Appendix D of this submission, however it should be noted that these may be subject to change as the design advances.

Table 3 Surrounding Works

WORKS	RESPONSIBLE	DETAILS
Toreopango Avenue 'Road Over Rail' Bridge (Refer Figure 7)	PTA / NEWest	4 lane (two in each direction) carriageway with 6m median island and 3m shared path on both sides of the carriageway.
Tokyu 3 Road Bridge (as shown in Blue in Figure 6).	PTA / NEWest	4 lane (two in each direction) carriageway with 6m median island and 3m shared path on both sides of the carriageway.
Tokyu 4 Road Bridge (as shown in Red in Figure 6).	YBJV	Out of scope for the YRE, and subject to future design by the responsible developer.
Yanchep Beach Road Bridge (Refer Figure 7)	PTA / NEWest	The bridge will be a 4 lane (two in each direction) carriageway with 6m median island and 3m shared path on both sides of the carriageway.  The METRONET scope of works for YRE covers the bridge only, with the responsibility of any associated widening of Yanchep Beach Road to be completed by the landowner.

Figure 6 - Supporting Bridges

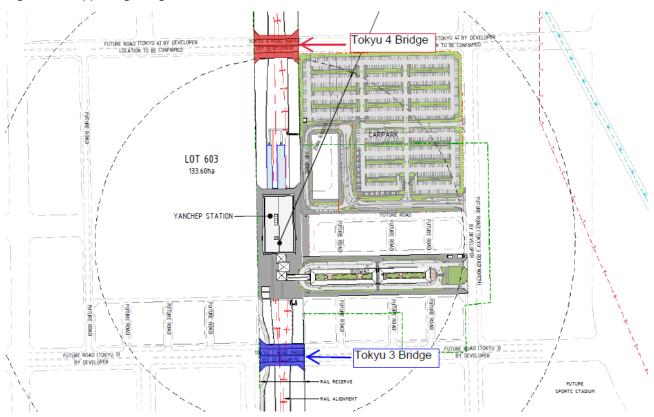
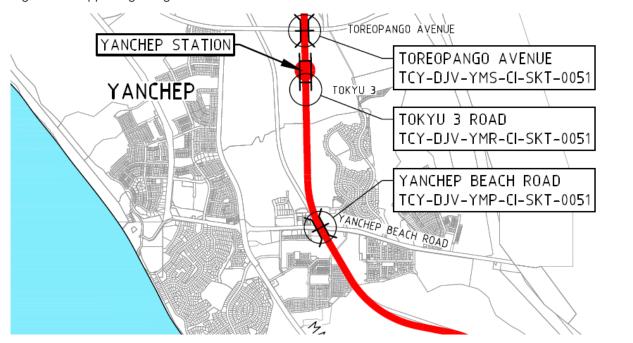


Figure 7 - Supporting Bridges

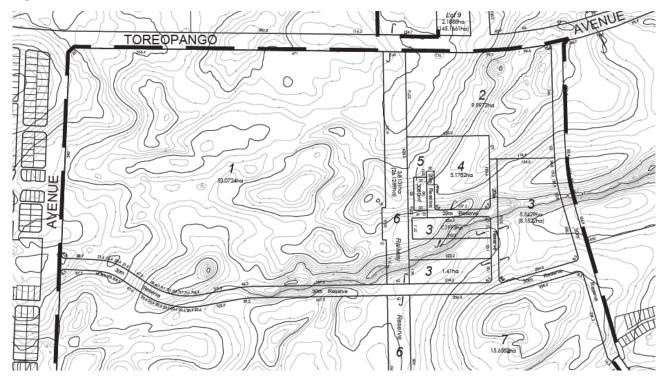


These bridge structures will ultimately form part of a wider road network, with both approval and construction of this supporting road network being the responsibility of the landowner. Importantly, Yanchep Beach Joint Venture has recently received subdivision approval for the creation of the road network required to support the day one operation of the Yanchep Station (WAPC Reference 158629), as displayed in Figure 8 below.

To ensure the construction of the road upgrades and bridges occurs in time for opening of the station, the NEWest Alliance and the PTA are conducting fortnightly interface meetings with Yanchep Beach Joint Venture. These meetings will assist in defining and negotiating the construction interfaces, such as design levels and appropriate road tie in. By its nature, this will remain a live issue through this development

application assessment process, but these regular interface meetings remain the most practical way to ensure an outcome is reached in time for the Yanchep Station operation.

Figure 8 - Plan of Subdivision WAPC Ref 158629



## 3.2.2. Yanchep Rail Turnaround Facility

As the Yanchep Station is an 'end of line' station, a train turn around facility will be located north of the new Yanchep Station and just north of Toreopango road. As this facility is directly and only associated with the YRE operations, and does not provide direct vehicle or pedestrian access to the station, this was determined to be exempt from the requirement for planning approval.

#### **DESIGN INTENT** 3.3.

As noted within Section 1 of this report, the scope of works set by METRONET includes a number of qualitative design measures which must be met in the station design. Table 4 below provides detailed information on how these qualitative design measures have been interpreted and applied to the Yanchep station design.

#### **DETAILS**

#### **Train Station Functionality**



The 'cut and cover' form of station achieves many of the benefits of a tunnel style station, including providing a station entrance at street level, reduced visual impact of the station and rail line, and lower impact of noise and vibration compared to traditional at grade station with elevated concourse. A section demonstrating the design of the station is provided at Figure 17 below.

The Yanchep station building will provide entrances along the south, east and west elevations, which will provide for pedestrian access east-west across the track line, and for direct access to the bus interchange located immediately south. The station booth positioned central within the concourse provides surveillance to the three station entrances.

The Yanchep station will be a monitored station with a combination of open access and fare restricted areas, controlled by automated fare gates. Importantly, movement between the station entries at the concourse level is not fare restricted, ensuring that the station concourse functions as a means of passing over the railway line without requiring pedestrians to 'tag-on'. This arrangement is best viewed in Figure 18 below.

This is an important measure for the precinct connectivity, as the station concourse will form a direct east/west pedestrian link through the Yanchep Activity Centre. Consistent with all PTA infrastructure, the station building will be designed to universal access standards.

#### **Station Architectural** Design



A pavilion theme is common to all three YRE Station buildings. A pronounced angled parapet suspended from outward turned columns floats above the Station's predominantly transparent façade. Between external painted steel columns low level canopies provide shading to façade glass and weather protection for patrons and pedestrians traversing the long north south axis of the station.

Roof skylights and concourse voids provide natural light through the station to platform level. The Station Booth positioned central within the concourse provides surveillance to the three Station entrances. Visual connectivity between the Station and the public domain allows a safe and practical interchange between travel modes of buses, cycling, walking and vehicles with minimal yet intuitive wayfinding requirements.

#### **Natural Light and Ventilation**

Principles of natural light, ventilation and weather protection have informed thearchitectural design of the station, with the following noteworthy design points:

Predominantly glazed facades to the station building facades on the east, west and south frontage.

#### **DETAILS**

- Three separate entrances provide for breeze into and through the concourse level.
- Glazed skylights incorporated in the roof structure.
- Void space at the first floor concourse and within the bus interchange areas, improving ventilation and providing natural light infiltration to the station platform level.
- The platform coverage achieves the 'Green Star Railway Stations' requirement of 20% of the platform area to be shaded for the afternoon peak periods during the warmest half of the year.

#### **Station Identity**

To create a stronger link to the cultural context and create a unique identity, each new station under the YRE line adopts Gnala Biddi references within the overall architectural and finishes theme of the station. For the Yanchep Station, the Yanchep Caves and Banksia flower are adopted for these design references.

These Yanchep Caves, which are a registered Aboriginal site in the region, underpin a number of stories and mythology about their creation and importance to Noongar people.

An orange colour theme which reflects the Banksia flower also underpins the material and finishes selection for the Yanchep Station, which is designed to add distinctiveness to the Yanchep Station.

These references are best viewed in the artists impressions provided in the figures below, but it must be noted that the interior design of the station building (such as the ceiling features) may be subject to change.

#### **Bus Interchange Design**



The southern station entrance provides direct access to the station plaza and adjacent bus interchange. The bus interchange is 'at grade' with the street, meaning access to the station from the adjacent station or main street is direct and intuitive.

Bus stand locations will be clearly signposted and illuminated with a direct and convenient pedestrian accessway. This includes a continuous canopy weather shelter between the station entrance and bus stops. The canopy is a simple low-pitched roof design. The bus standards are located adjacent to the central island, restricting the potential for conflict between the passengers and buses.

The bus interchange area is designed as a bus only space, meaning there will not be standard vehicles passing by the station entrance. This serves the logical benefit of creating a low traffic environment which is also more accommodating to pedestrian movements.

The east-west orientation of the bus-way cell perpendicular to the train station orientation is a point of difference for the Yanchep Station (when compared to the two other new stations on the YRE line). Benefits of this orientation are as follows:

# **PROPOSED DETAILS** creates a more efficient use of the station frontage. This provides the opportunity for supporting future ground level commercial development to benefit from passing trade spilling out from the station; and

## **Pedestrian / Cyclists** Infrastructure and Wayfinding



Efficient and logical pedestrian and cyclist movements is a driver in the layout of the station and supporting infrastructure. Most notably, this includes aligning the station building with the planned future main street, which will provide a pedestrian connection to the planned future town square.

provides direct frontage to the adjoining commercial development, creating both mutual surveillance and passing trade benefits.

Pedestrian and cyclists accessibility to, from and around the station is summarised as follows:

- The PSP west of the rail corridor will provide the regional pedestrian and cycling network.
- The PSP will ramp up to the station concourse, and merges with the station forecourt at the south west corner.

This PSP connection is part of a 13.8km extension from Butler to Yanchep. As Yanchep Station is the end of line, this PSP network terminates at the Yanchep Station, making Yanchep the final destination for cyclists on the network.

The two bicycle shelters are provided adjacent to where the PSP network merges with the station forecourt. This layout will reduce the potential conflict between passengers and cyclists around high pedestrian areas.

Pedestrian modelling has been assessed using the LEGION modelling tool for the peak 2031 customer patronage, which calculates pedestrian congestion based on a level of service performance criteria. This assessment concludes that the pedestrian network supports the projected patronage numbers.

### **Station Parking**



To ensure the parking facilities do not undermine transit orientated development principles, the long-term park-and-ride bays are located east of the rail alignment, distinctly separated from the planned main street to be delivered by the developer.

Long-term car parking is also located with greatest distance from the station entrances. This design serves two key purposes, being:

- Encouraging pedestrian and bus transport ahead of private vehicle use; and
- Encouraging 'park-and-ride' patrons to travel through the town centre designated space immediately south of the car park to access the station.

#### **DETAILS**

The Yanchep Station is also unique in the layout of the 'kiss-and-ride' area, which has been designed to accommodate a central future development parcel. This layout provides multiple benefits, including mutual surveillance and activation. This design also provides further opportunities for either the kiss-and-ride or park-and-ride patrons to engage with this activity centre development on the way to and from the station building.

In accordance with the Transperth operational requirements, the car parking will only be made available to the Transperth patrons (similar to the management of all Transperth dedicated parking facilities across Perth). However, as parking is applied on a 'day-rate' basis, this management measure enables patrons to undertake incidental multipurpose trips within the Yanchep town combined with their commute.

#### **Other Station Amenities**



Station amenities are located at the crossroads of the east, west and southern entries within a generous front of house circulation area. Staff facilities are located at the south end of the concourse for direct access for bus drivers and bus transfer. Importantly, essential public amenities such as toilets are provided in the non-fare areas.

Figure 19 below outlines the unpaid zones which provide free public movement, and Figure 20 identifies the staff and public amenities at the concourse level.

#### Landscaping



High quality hard and soft landscaping design has been proposed for the Yanchep Station. The key principles underpinning the landscape design are as follows:

- Retention of vegetation where possible. This remains subject to detailed civil and construction requirements.
- Reduction of heat island impacts. This includes diamond tree planting between parking spaces within the long-term parking area. Some deciduous trees will also be provided along pedestrian routes to achieve summer shade and winter sun infiltration.
- Low maintenance of vegetation, including minimising irrigation. This is achieved by using local natural species (such as Banksia and Eucalyptus varieties) where possible, supported by exotic species only where specific vegetation characteristics are required.
- Paving and road materiality is used to create subtle wayfinding cues and define pedestrian priority areas. This includes the use of high-quality pavers around the station forecourt and key area of

#### **DETAILS**

the busway to achieve a distinctly different feel to the thoroughfare areas.

Large quantities of seating is required, but must be delivered in a manner which minimises obstruction to key movement areas. Insitu seating incorporated into raised planters will be applied where possible to achieve this.

The preliminary landscape plan is provided at **Appendix E** of this report.

## **Crime Prevention Through Environmental Design** (CPTED)



Designing out crime and the creation of a perception of safety is recognised as an important consideration in the delivery of a contemporary public transport node. Whilst a thorough surveillance system and security presence is an important part of this, the design of the physical environment to incorporate CPTED principles plays an important role in providing basic foundations to manipulate human behaviour towards crime prevention, as and ultimately creating a safe environment for passengers.

CPTED measures which may be pragmatically applied to the station design are broadly summarised as follows:

- The station building contains three active facades with an entrance point to the east, south and west. These active frontages provide surveillance along the planned main street and pedestrian network east and west of the station, and the station plaza to the south.
- The alignment of the station plaza with the adjoining busway provides mutual surveillance between the two areas.
- High activity zones, such as the busway and kiss'n'ride area, are located closest to the station entrance. More dormant uses such as the long-term car park is located towards the station periphery.

An unobstructed view corridor is created between the western and eastern forecourt through the station concourse.

The station concourse is designed in a mezzanine type structure with a void to the platform below. This allows for surveillance between the concourse and station levels.

Pedestrian movements around the station are channelled through the use of defined pedestrian paths and supporting landscaping cues, such as raised planters and tree corridors.

Reducing large vegetation canopy around the station building to ensure CCTV view is not restricted. The landscape design will also incorporate hard landscaping elements (such as raised planters and street furniture) to enforce an anti-vehicle (hostile threat) environment around the station building to deter unwanted vehicles from entering pedestrian only spaces.

#### **DETAILS**

#### **Supporting Bus Services**



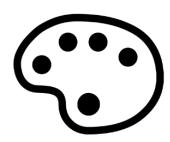
To deliver an integrated transport solution which connects the key activity centres within the rail extension area, a comprehensive feeder bus network will be delivered to support the Yanchep Station.

As detailed in Section 1.1 of this report, a number of future bus routes have been identified for further development that typically loop between the new stations and service the suburbs in between.

The bus services will increase the number of passengers arriving at the Yanchep Stations via public transport and reduces the demand for station car parking.

Final service specifications of the day one and ultimate scenarios will be subject to detailed planning, allocation of funding, and community consultation, which is ongoing.

#### **Public Art**



Public art within the station will be delivered in accordance with the requirements of the WA State Government Percent for Art Scheme, which requires 1% of the construction budget for new works over \$2 million to be spent on artwork.

This artwork will be delivered to be consistent with the themes of the wider 'METRONET Public Art Strategy' and associated 'Yanchep Rail Extension & Thornlie-Cockburn Link Projects Public Art Strategy', with the thematic framework strongly built around the Gnarla Biddi story of 'Our Pathways'.

A summary of the scope of works for public art is provided at Appendix F of this report.

The integration of this artwork into the station design will be further developed through the detailed design phase, and it is expected that an associated standard condition of approval will be applied.

Figure 9 Artist Impression of Yanchep Station Building, as viewed from the south east



Figure 10 Artists Impression of Yanchep Station Building, as viewed from south west



Images are included for illustrative purposes only

Figure 11 Artist Impression of North East Facade



Figure 12 Artist Impression Station Building



Figure 13 Artist Impression of Station Building Concourse Level, as viewed from the southern entrance

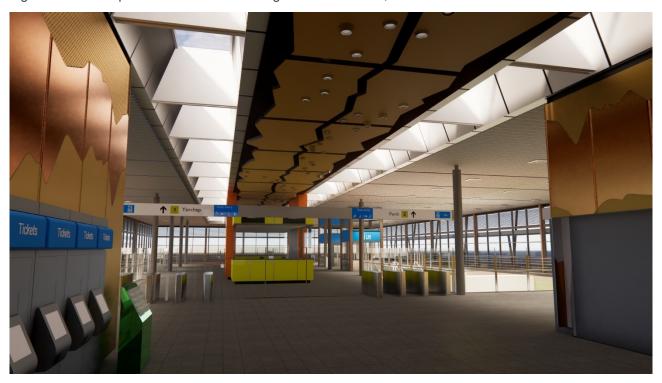


Figure 14 - Artist Impression of Station Building Concourse Level



Figure 15 Artist Impression of Station Building Concourse Level and Platform Level Below

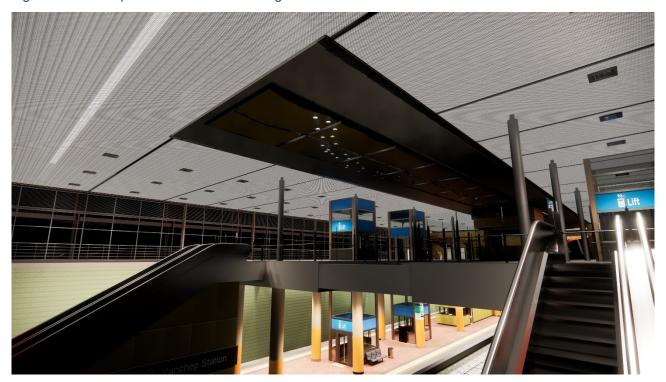


Figure 16 Artists Impression of Concourse Level

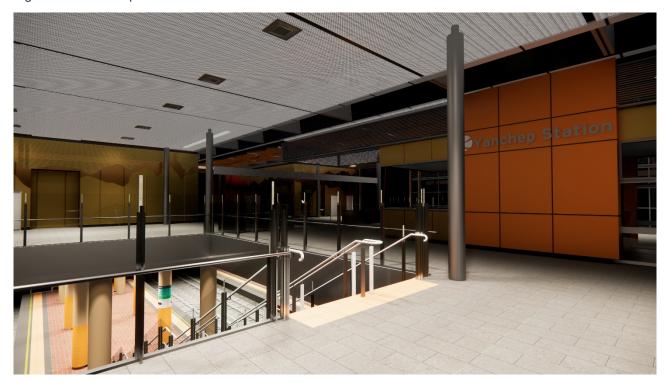


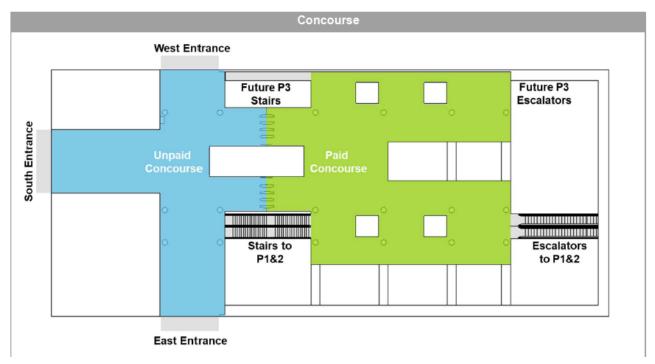
Figure 17 - Artists Impression of Internal Night Lighting



Figure 18 - Station Section Plan



Figure 19 - Station Concourse Fare Restriction Layout



MAINTENANCE STORE PASSAGE ACCESSWAY 1 CLEANER TPC FUTURE FUTURE ESCALATOR ELECTRICAL SAFE FUTURE ESCALATOR .ZONE GSS FARE GATES (UNPAID ZONE) (PAID ZONE) ENTRY CONCOURSE CONCOURSE PUBLIC UAT LINEAR SKYLIGHT OVER YOLO PUBLIC FEMALE MALE-K FFL 35.200 \* III/IIIII/IIII SAFE ZONE KIOSK [ STAIR \_\_\_ VM STAFF-OFFICE CIOSK STORE - VOID ENTRY ACCESSWAY 3 STAFF FEMALE STAFF UAT

Figure 20 Public (green) and staff (red) amenities within concourse level

BIKE RACKS

#### AGENCY AND STAKEHOLDER CONSULTATION 4\_

Since the formal announcement of the YRE line, the YRE line and associated stations have been the subject of significant public consultation and stakeholder sessions. A detailed summary of these consultations including key outcomes is provided at **Appendix G** of this report.

These consultations included two development application focussed pre-lodgement meetings conducted by Urbis on 14 July 2020 (focussed around Eglinton Station and Yanchep Station) and 17 August 2020 (focussed on Alkimos Station), which included discussion around the planning process and relevant planning considerations. Key outcomes of these meetings were as follows:

- Agreement that the application would be the subject of a 14-day consultation period conducted by the METRONET department of DPLH, and on this basis, no consultation period was required to be conducted by the local government directly.
- Formal referral to the City of Wanneroo's Council meetings was not required prior to the City making its recommendation to the DPLH. This decision was formed on the basis that the City is a referral agency only, and the DPLH is ultimately responsible for a decision on the application.

Importantly, the NEWest Alliance will continue to conduct regular public and stakeholder consultation sessions throughout this project, which will occur independent of this development application assessment process. This includes regular interface meetings between NEWest Alliance with the interfacing land developer to discuss design matters and construction interfaces.

#### 5. **TECHNICAL REPORTS**

#### **CATCHMENT ANALYSIS** 5.1.

Given there is limited opportunity to 'retro-fit' the train station operations, an important consideration in the Yanchep Station design is the future-proofing of the station, including ensuring that the design of the station appropriately considers the long-term catchment and associated mode demands. To support this objective, the Yanchep Station has been the subject of a number of access planning studies and regional transport modelling, which has informed the SWTC. The key findings are summarised in a memo provided at **Appendix H** of this report.

The future catchment, including the likely transport mode, forms an important component of this catchment analysis and associated station design. The methodology applied to the various transport modes as part of this catchment analysis is as follows:

- A catchment distance of 800m to 1,600m is applied to the future walkable catchment, which translates to a 10 to 20 minute walk.
- A 3km catchment distance is applied to the cyclable catchment, which is equivalent to a 10 minute
- A catchment distance of 400m is applied to indicative future bus routes.

The presumption for all modes is that patrons are most likely to travel down-stream to access the station, rather than back-tracking from the destination. For the Yanchep Station, this suggests that the future catchment will be predominately from the north, east and west, with the patrons south of the station most likely to travel to Eglinton Station.

With the goal of encouraging transport orientated development in mind, higher weighting has been given to 'bus and ride', cycling and walking modes of transport in the catchment analysis.

The resultant daily forecast patronage for the Yanchep Station is presented in Table 5 below.

Table 5 Yanchep Patronage

Patronage by Mode	2021	2031
Walking	336	2,154
Cycling	240	431
Bus	1,680	2,585
Kiss'n'Ride	960	1,292
Park'n'Ride	1,584	2,154

The analysis concludes that the 995 car parking bays proposed for the Yanchep Station may be less than the passenger demand for 'park-and-ride' bays, based on a 'business as usual' analysis. Whilst mode demand based on the catchment analysis is important, it is also recognised that passenger behaviour may be influenced based on the designed convenience of the respective modes, and supporting marketing strategies. In this respect, a light shortfall in car parking bays is an important tool in driving passenger transition from 'park-and-ride' towards active transport via bus, cycling or walking.

With transport orientated development being a desired outcome for the Yanchep Station, the intent is to design the station to provide incentives for passengers to consider non-car modes of travel. As a result, a modelled shortfall in the long-term parking demand is considered to be an acceptable outcome.

#### **5.2.** TRANSPORT IMPACT ASSESSMENT (TIA)

A Transport Impact Assessment assessing the suitability of the existing and future road network is provided at Appendix I of this report. As a Yanchep Station is a multi-modal station, this assessment has considered the following:

- The suitability and capacity of the existing and future road network to accommodate vehicle movements:
- Supporting bus routes and associated bus interchange servicing and design; and
- Pedestrian and cyclist access and connectivity.

The following sections provide a summary of the relevant information and key findings for each area.

## 5.2.1. Road Capacity

Given the currently lack of supporting road network, the assessment of the road network has been undertaken based on the two key project stages, being:

- 'Day 1 Operation', modelled at 2021. This road layout is consistent with the layout approved under subdivision 158629 (refer to Section 3.2 of this report).
- 'Assumed Road Network Under Future Scenario', modelled at 2031 accordance with the assessment requirements under the WAPC Transport Impact Assessment Guidelines. Future road connections will be generally in accordance with the Yanchep City Centre Structure Plan, which is discussed in detail within Section 7.4.2 of this report.

The AM/PM peak period for the Yanchep Station has logically been identified as 7:00am to 8:00am and 5:00pm to 6:00pm respectively. Key findings of the TIA are as follows:

- Surplus capacity is provided for 'Day 1 Operation' with all intersections providing a Level of Service A result in the SIDRA analysis.
- Satisfactory capacity is provided for the established operation scenario. The worst-case scenario resulted in a Level of Service C for the bus interchange egress, but typically a Level of Service of A or B was achieved for the remaining intersections.

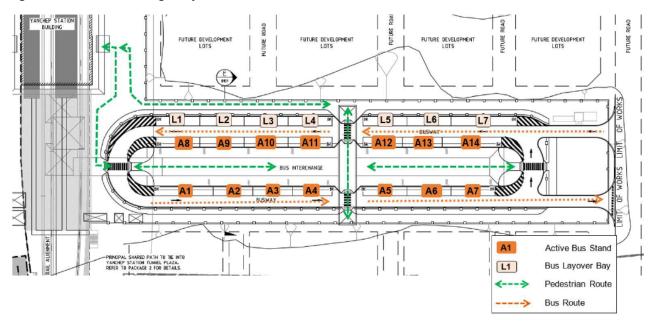
Overall, the modelling outcomes suggest a suitable outcome for a town centre environment, which appropriately meets the capacity requirements set by the SWTC (which requires a minimum LoS C) and the desire to not over-supply infrastructure for the private vehicle long-term.

# 5.2.2. Bus Servicing and Interchange Design

All new stations proposed under the YRE will be multi-modal stations, meaning that the stations will contain a bus interchange and supported by numerous bus services. For the Yanchep Station, this bus servicing will include a mix of high frequency and standard bus services, noting that these bus services and routes are still to be finalised subject to area need and funding.

The Yanchep Station provides the bus interchange to the south east of the station building, which integrates the interchange with the future activity centre. A visual summary of the bus and pedestrian movement network around this bus interchange is detailed in Figure 21 below.

Figure 21 - Bus Interchange Layout



## 5.2.3. Pedestrian and Cycling

A regional PSP connection will be established as part of the YRE project, which will provide a 13.8km network extension from Butler Station to Yanchep Station. The PSP will be a 4m pathway with 0.5m shoulders on each side, located west of the railway tracks within the railway corridor.

For the Yanchep Station, the PSP approach from the south, travels beneath the Tokyu 3 road bridge south of the station, to then ramp up and integrate with the station forecourt. This PSP network is expected to be supported by a local cycle network implemented as part of the future Yanchep ACP as detailed design progresses.

#### 5.3. ENVIRONMENTAL NOISE AND VIBRATION MANAGEMENT PLAN

The PTA are committed to the management of airborne noise, ground-borne vibration and ground-borne noise arising from the operation of the new railway infrastructure. It is also a requirement of the SWTC for NEWest to design and build new stations to comply with both the Environmental Protection (Noise) Regulations 1997, as guided by State Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4).

The following provides a summary of the noise modelling outcomes applicable to the station itself, as well as the ongoing assessment which is being conducted by the PTA for the rail operation (which is not subject of this development application).

# 5.3.1. Station Operation Noise Modelling

The key acoustic issues associated with the station are predominantly environmental noise emission from station and entry buildings (including public address announcements and passenger movements), noise emission from car parking areas and bus movements. The report provided at **Appendix J** outlines the outcomes of this assessment.

#### Noise Emission - Mechanical Plant

Environmental noise levels from the Yanchep station due to building services noise have not been assessed as the mechanical design has not sufficiently progressed to establish equipment selections. However, it is expected that standard noise control measures will be sufficient to control mechanical services plant noise in order to meet the required environmental noise criteria at adjacent noise-sensitive receivers.

#### Noise Emission - Car Parking Areas

The noise from the proposed western and eastern car parks has been assessed, based on the car park layout and pavement design undertaken by the civil consultant. The predicted noise levels at the noisesensitive receivers nearest the car park were found to be below both the day time and night time environmental noise criteria.

#### Noise Emission - Public Address System

Noise levels at nearby noise-sensitive receivers from the station's PA system have not been assessed as the PA design has not sufficiently progressed to establish equipment selections. However, a limiting sound power level for the equipment has been established which should enable the environmental noise criteria to be achieved.

#### Noise emission – new station entry road and bus movements

The connection road between the proposed new car park and the future local north-south internal precinct road, the associated patron vehicles using this road and connecting to the future Tokyu 3 and Tokyu 4 roads, as well as the bus movements along the internal station area, are required to be assessed against the road traffic requirements of the SPP 5.4.

The noise from the proposed new car park connection roads, associated vehicles on the future road network and bus routes accessing the new bus station has been assessed. The modelled noise levels are predicted to achieve the SPP5.4 traffic noise targets at the nearest potentially-affected receivers to the north and west, but slightly exceed the daytime targets at the nearest receivers to the east and south. However, no mitigation measures are proposed, as:

- Predicted traffic noise levels associated with the station alone are expected to be minimal and indiscernible when compared to traffic noise levels generated at this receiver from traffic in the larger development area
- The selected receiver locations may be overly conservative, with realistic worst-case receiver locations set further back from the road/rail corridors
- Construction of noise walls where there is currently no development is not required, as these future dwellings are expected to comply with the requirements of SPP5.4, and adopt quiet house design measures.

# 5.3.2. Rail Operation Noise Modelling

Noise modelling for the rail operation will be completed independent of this development application process, given the rail and associated train operation is exempt from the requirement of planning approval. Preliminary noise modelling completed on the rail operation indicates that noise targets may be exceeded at a number of sensitive receiver locations. As a result, some degree of noise and vibration mitigation is will be incorporated into the rail corridor construction, in the form of noise walls in the appropriate areas along the corridor, and ballast matting underneath the entirety of the rail line.

The PTA have also committed to a further operation noise monitoring program will be implemented within three months of the opening of the proposal, and again at 18 months. Further detail on these ongoing management measures is provided within Section 6 of this report.

#### **5.4.** OTHER TECHNICAL ANALYSIS

Table 6 below provides a summary of the other supporting technical reports applicable relevant to this development application.

Table 6 - Summary of Other Technical Inputs

Input	Details
Bushfire (Appendix K)	The Bushfire Attack Level (BAL) assessment provided at <b>Appendix L</b> of this report confirm that the post-development site conditions will still provide experience some potential exposure of the station building within areas above a BAL-low rating. As a result, it is recognised that a Bushfire Management Plan (BMP) is required to support the development application, and this will be provided shortly following lodgement under a separate cover.
	It has been recognised that achieving full compliance with State Planning Policy No. 3.7 – Planning in Bushfire Prone Areas from day one operation will be a challenge for all new stations along the YRE line. For the Yanchep Station, this bushfire risk is recognised to be a short-to-medium term issue, and will ultimately be alleviated once surrounding development of the Yanchep Strategic Metropolitan Centre progresses.
	The proposed solution may be to progress the Yanchep Station through the 'unavoidable development' pathway, but still seek to achieve the highest level of bushfire protection which is pragmatically achievable. Details of this will be provided through the BMP.
Stormwater Drainage Design (Appendix O)	Stormwater runoff from the precinct is captured, conveyed and discharged within five subcatchments discussed in further detail below. Each of the sub-catchments aims to detain the 10% AEP 12 hour storm event while providing an overland flow route for storms exceeding the volume of the design storm. In lieu of infiltration testing, all calculations have used a permeability rate of 2 m/day and a deep-water table model. Tank sizing can be revised once the results of permeability testing are available. The Perth Groundwater Atlas indicates that historical groundwater maximums are approximately 2-3 m AHD, at least 27 m below the lowest point of the precinct.
	Gross pollutant traps are provided upstream of all underground tanks to collect debris prior to the tank; with the exception of hydraulic drainage connections. Water sensitive urban design principles suggest that 2% of the development area should be allocated to biofiltration. As the precinct area (including the local road) is 6.9 ha, a total of 1400sq.m of biofiltration area is required which can be accommodated within the swales provided. All pits are typically either grated gully pits or manholes as per Main Roads standard details with 1200 mm diameter liners.
	Runoff from the Station Plaza and Bus Interchange is captured in traditional pit and pipe networks and conveyed to an underground tank at the eastern end of the Busway. The tank is positioned to fall within the open area at the end of the busway, therefore eliminating potential clashes with busway structures and providing good access for maintenance. During large storm events the tank is expected to surcharge via the easternmost pits with stormwater flowing into the adjacent road reserve. Two manholes to provide connections for roof drainage are

# Input

### **Details**

provided. The exact locations of these manholes will need to be coordinated

Runoff from the western half of the station building is discharged to a single manhole on the western side of the building via building hydraulics. The manhole is connected to an underground tank which has been designed as a long row of single cells, providing additional clearance to the station building and station boundary. Strip drain is provided along the station boundary to capture runoff exiting the precinct. During large storm events the tank is expected to surcharge and stormwater to flow away from the station building. Further design will investigate the possibility of discharging the station building drainage to the rail corridor, reducing the size of underground storage tanks.

Drainage networks have been designed so that runoff from the eastern side of the Station building and the drop-off area are not conveyed across possible future road reserve which may sever pipe connections and provide constraints for future construction or necessitate easements. Runoff is collected in traditional pit and pipe networks and discharged to an underground tank positioned beneath the drop-off. The tank is located to fall outside possible future roads, while providing access points outside the through lane of the drop-off.

During large storm events the tank is expected to surcharge and stormwater to flow to the adjacent local road. Future design should consider the possibility of discharging the station building drainage to the rail corridor, reducing the volume of tank required. A high point has been created on the private drop-off road at the pedestrian crossing, which in turn has created very slight grades of approximately 0.2% at the pedestrian crossing. Consideration should be given to placing a speed hump or similar treatment at the pedestrian crossing, eliminating any flat kerb spots while slowing traffic and providing right of way to pedestrians.

The local road within the overall station precinct is expected to be controlled by the local authority after construction and therefore the piped drainage network had been kept separate of the adjacent carparks and drop-off area. The local road drainage network is reverse graded to flow from north to south from the trapped low point at the cul-de-sac. The piped network then flows east along the road to a point of discharge at the eastern edge of the precinct. The expectation is that runoff collected from this local road will be discharged to the drainage network of road following the eastern boundary of the precinct.

Carpark 1 accommodates several swales which collect the majority of runoff from the carpark. Swales are provided with catchpits to allow water depths of 300mm before discharging to the piped network. Slight grades within the carpark mean that drain blocks have not been considered at this stage, but future development of the carpark grading may warrant their use. Runoff from the internal carpark access to the north is also captured in traditional pit and pipe networks to connect to the Carpark 1 drainage. Piped networks are provided to convey flows from the gully grates and catchpits to an underground tank located in the eastern side of the carpark. The tank is positioned to avoid the widened road reserve of possible future roads, avoid swales and maintain access point within parking bays (rather than

# Input

### **Details**

parking aisles). During large storm events the tank is expected to surcharge via the easternmost pit of the carpark access road and flow into the adjacent road reserve.

Carpark 2 accommodates larger swales, which allow a ponded depth of 500 mm before overflowing into catchpits. PC sump analysis has indicated that these swales can detain and infiltrate the 10% AEP storm for their respective rows, and as a result the catchpits are only provided for storms exceeding the 10% AEP. Ponded depths for the swales are approximately 300 mm in the 1 EY and therefore it is not believed that fencing required. Similarly to Carpark 1, gully grates are provided at the end of carpark rows. A pipe network is provided to convey ordinary flows from these gully grates and large storm events from the catchpits to an underground tank located at the north-eastern corner of the carpark. During large storm events the tank is expected to surcharge via pits located at the carparks low point in the north-eastern corner and flow into the adjacent road reserve.

The grading of the site is discussed is more detail in the following section; however, it is important to note that the grading is based on an ideal situation where the developer meets the threshold levels of the station precinct and allows overland flows into the surrounding road reserves. This allows the grading of the station precinct to be graded suitably away from the rail reserve and station building in a rational manner. The drawback of this strategy is the risk associated with the predevelopment scenario; the time between day one opening of the station and the construction of the wider development. During this time, overland flow routes which are designed for the post-development scenario may not be possible due to higher ground surrounding the precinct; and therefore, if a storm water volume exceeding the 10% AEP falls within the site flooding of the carpark may occur. The overland flow routes from the station building is available from day one opening.

A preliminary stormwater design will be provided under a separate cover for consideration as part of this development application. But it is also expected that a final stormwater design will be delivered through a condition of approval.

# **SUPPORTING APPROVALS AND MANAGEMENT PLANS** 6.

A number of environmental approval processes and associated management measures required to deliver the station have been progressed, which has occurred independent of this development application approval process. The following table provides a summary of those approvals.

Table 7 Summary of Supporting Approvals and Management Measures

CONSIDERATION	DETAIL		
Environmental Approvals	Ministerial Statement 1129 (Eglinton to Yanchep) has granted approval under the <i>Environmental Protection Act 1986</i> for the clearing and disturbance of vegetation associated with the construction of the extension up to Yanchep Station.		
	Conditions of this Ministerial Statement 1129 require the implementation of three management plans, being:		
	<ul> <li>Green Bridges Management Plan, relating to the rail corridor construction through the bush forever areas (noting that this must be approved by the regulator prior to works within Bush Forever Site 289 – approval pending);</li> </ul>		
	<ul> <li>Indirect Impact Management Plan (must be approved by the regulator prior to works within Bush Forever Site 289 – approval pending);</li> </ul>		
	<ul> <li>Revegetation Management Plan (must be approved prior to the completion of construction works within Bush Forever Site 289 – to be prepared).</li> </ul>		
	Approval EPBC 2018/8262 is also in place granting Commonwealth environmental approvals under the <i>Environment Protection and Biodiversity Conservation Act</i> 1999.		
	Amendments to these approvals is likely to be required due to subsequent changes to the development envelopes, however these will be progressed independent of the development application process.		
	Further details of the environmental management strategies is provided at <b>Appendix L</b> of this report.		
Noise Monitoring Program	A noise monitoring program will be implemented within three months of the opening of the YRE line, and again at 18 months, to assess the effectiveness of noise mitigation. Specifically the program will:		
	<ul> <li>Confirm the as-built and operating railway achieves the Policy target LAeq (Day) 55 dB and LAeq (Night) 50 dB unless higher levels are permitted due to the incorporation of specified house facade protection.</li> </ul>		
	<ul> <li>Assess the accuracy of the pre-construction noise modelling predictions that were used to determine noise reduction treatments.</li> </ul>		
	The PTA also has existing procedures for receiving noise complaints, which will be extended to the YRE operations.		

CONSIDERATION	DETAIL
Out of Hours Work	Due to the nature and scale of the project, it is likely that some degree of 'out of hours' and 'night shift' work will be required during the construction stage of this project.
	An Out of Hours Construction Noise and Vibration Management Plan will be provided to the City of Wanneroo prior to these out of hours works occurring. Acceptance of this Construction Noise and Vibration Management Plan will meet the notification / approval requirements as required by the Environmental Nosie Regulations.
	For the purpose of the planning approval process, we request that any condition of approval related to construction hours is worded in a manner to not restrict these out of hours works.
Construction Management Plan	A Construction Management Plan will be delivered by the PTA / NEWest Alliance prior to works commencing on site, which is expected to be reflected through a condition of development approval.  A summary of the YRE Construction Program is provided at <b>Appendix M</b> of this submission.

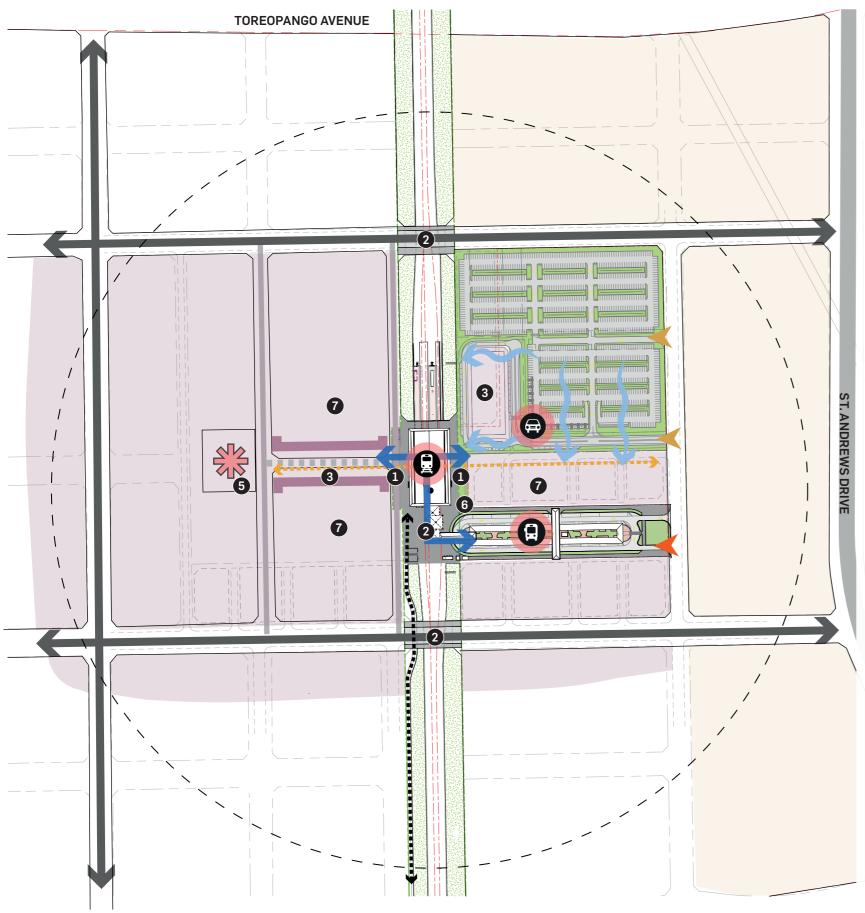
### **PLANNING ASSESSMENT** 7.

### 7.1. STATION DESIGN PRINCIPLES AND DESIGN REVIEW

State Planning Policy No. 7 – Design of the Built Environment (SPP7) provides a broad framework intended to facilitate qualitative performance-based assessment, with the ultimate aim of achieving good quality design outcomes. The framework is underpinned by the 10 design principles, which are considered and applied through the design assessment and review process.

The YRE project as a whole was subject to initial design comments from the State Design Review Panel (SDRP) in December 2019, and further Office of Government Architect comment in February 2020. Given the significance of the Yanchep Activity Centre, the Yanchep Station was then subject to a second dedicated review by the SDRP in May 2020. Importantly, the comments which were received on the Yanchep Station have been applied to the remaining stations on the YRE, where practical and applicable. A summary of the comments, recommendations and associated modifications to the plans arising from these design review sessions is detailed at **Appendix N** of this submission.

Given all stations on the YRE line are placed within an activity centre, the alignment of the YRE station architectural design and layout with the future desired layout of the activity centre is essential. Figure 22 below provides the 'Station Design Principles Plan' demonstrates this alignment, and includes specification of the key principles underpinning the station's design within its context.



# **YANCHEP STATION DESIGN PRINCIPLES PLAN**

# LEGEND:

DA Boundary Main street Destination: Train Station

Active core Active edges Priority pedestrian route



> Dedicated bus access

Potential future link

Pedestrian link

Regional PSP

Sport & Health

# **DESIGN PRINCIPLES:**

Higher order road

Kiss & Ride

Destination: Bus Station Destination: Park & Ride /

Destination: Town Square

# 1 INTEGRATED TRANSIT HUB

- · Street level integration of the station on both sides of rail corridor
- · Direct visual and pedestrian connection through main street between town square and station building
- Main station entry points provide a pedestrian focus separating bus and parking services to the east
- Station building serves as a connection point for transit services as well as cycle and pedestrian routes

# CONNECTED AND LEGIBLE

- Key pedestrian links between transit nodes and town centre along the main street encourages activation
- Regional PSP terminates at station, connecting to local level streets and cycle routes
- · Centrally located transit node acts as a landmark and assists wayfinding throughout active core and health precinct
- The station engages with town centre's gridded street network allowing for pedestrian permeability
- Train station situated between two major railway bridges provides vehicle connectivity from surrounding development beyond the active core

# 3 ACTIVATION AND SAFETY

- Regular arrivals and departures from the train and bus station reinforces activity through the town centre and main street, and provides passive surveillance of the station and surrounding streets
- Active main street provides a welcoming entrance to the transit hub from the western approach
- · The station creates an opportunity for high intensity development with strong walking and cycling
- Future development parcel within the kiss 'n' ride area, provides opportunities for surveillance and activation

# 4 AMENITY AND CHARACTER

- Station acts as a central node, connecting development east and west of the rail corridor with active and safe pedestrian links
- Multi-modal transit hub provides various transport modes including train, bus, car parking and drop off access, pedestrian and cycle links
- Station provides a safe and comfortable environment with sheltered waiting zones for bus and vehicle pick up, bicycle lock up facilities
- Transit hub provides wider accessibility to future town centre and sporting and health precinct developments
- Station building architecture and urban design of the station precinct responds to local climatic conditions and environmental characteristics of the local area, while contributing to a sense of place within a future urban setting that is commensurate in scale and function to an emerging Strategic Metropolitan Centre

# 5 SUSTAINABILITY AND COMMUNITY

- Station is a community focal point enabling social and community activities by providing integrated access and various transport modes
- Town square facilitates social interaction, interfaces with development and provides an accessible space for
- Transit amenity supports a diverse range of relevant destinations for the local and wider community supported by sustainable modes of transport

# 6 AESTHETIC AND LANDSCAPE

- Separated vehicle & bus access points reduce vehicle congestion and enables a pedestrian focussed main
- Landscaping acts as a buffer to soften hard infrastructure edges
- Lowered rail line allows for visibility of station buildings and lessens impact of rail corridor on visual and physical access
- Yanchep Caves and Banksia colour and materials theme creates a unique character for the Yanchep station

# 7 CONTEXT AND SCALE

- The main street environment encompasses the station building as part of the town's activity
- Town centre intensity and scale built up around the station site highlights the transit hub as an important anchor for the precinct



**DATE:** 28.08.2020 **JOB NO:** P0022083 **DWG NO:** 02 REV: A

# 7.2. METRONET STATION PRECINCT DESIGN GUIDE

The METRONET Station Precinct Design Guide provides specific design guidance aimed at the design and planning of station precincts, including the design objectives which are fundamental to the delivery of a METRONET station.

Importantly, the METRONET Station Precinct Design Guide emphasises that a 'one-size-fits-all' approach cannot be applied to station design, and instead a station must be designed on a case-by-case basis considering the transit function, context and development potential over time. This is particularity relevant to the YRE stations given the surrounding centres are in the early stages of urban development, and the ultimate activity centre station including the form of landside development will to be refined over time.

The Station Precinct Design Guide sets out 8 critical element objectives which require the specific planning response to support successful long-term station development. These requirements vary depending on the station precinct type. As Yanchep Station is a 'Strategic Metropolitan Centre' the station best being classified as a 'SP2 – Strategic Centre' form of station precinct type, with the following station precinct type description

Strategic centre station precincts are places with well integrated connections to quality transit and a comprehensive range of retail, commercial, service and community facilities and employment opportunities. These station precincts have significant transit oriented development potential and include station precincts located in established and redeveloping major mixed use activity centres, and newly developing major activity centres in greenfield locations being established around rail services.

Many of these 'critical elements' are most applicable to the development surrounding the station, and is beyond the scope of the Yanchep station development. However, the aspects which are applicable in some aspect are:

- Critical Element 3: Street Design and Movement Priority
- Critical Element 5a: Transit Integration Rail
- Critical Element 5b: Transit Integration Bus
- Critical Element 6: Station Type
- Critical Element 7a: Station Dedicated Parking
- Critical Element 8: Public Realm and Public Open Space.

The following table applies these 'Strategic Centre' critical elements to the proposed Yanchep station design.

### STATION CRITICAL ELEMENT

### **DETAILS**

# **Critical Element 3: Street Design and Movement Priority**

Preferred: pedestrian priority

The prioritisation of pedestrian movements is primary driver to the station design, and is best demonstrated by the proximity to the station entrance. This hierarchy is as follows:

- 1. Pedestrian / cyclists infrastructure is closest to the station. Short term unsecured bicycle bays are provided adjacent to the station entrance, and long term secured parking is located south and north of the station entrance.
- 2. Bus interchange facilities are immediately adjacent, connection to the station entrance via the station plaza.
- 3. The 'kiss'n'ride' drop-off facility
- 4. Private vehicle infrastructure is located north-east of the station, furthest removed from the active areas of the station.

This is a pedestrian first design, but still delivers the necessary parking for a major train station in an emerging activity centre setting.

Local/ urban streets: up to 40km/hr

The PTA is only responsible for the construction of the station internal roads (providing direct access to the bus areas and car parks) and bridges. All other roads are to be constructed by the Yanchep Beach Joint Venture.

Urban Arterials (frame): 50km/hr

The PTA is only responsible for the construction of the station internal roads (providing direct access to the bus areas, 'kiss'n'ride' around the development lot and car parks) Tokyu 3 bridge, and Torepango road bridge. All other roads and bridges are to be constructed by the Yanchep Beach Joint Venture.

# Critical Element 5a: Transit Integration - Rail

Preferred minimum rail integration type:



**Underground Tunnel** 

Yanchep Station will be a 'cut and cover' station, consistent with the 'considered minimum' station design for a Strategic Centre.

Considered minimum rail integration type:



Cut and Cover



Elevated on Viaduct

It is important to note that whilst the Yanchep station is not entirely a tunnel design, station includes a large ground level cover of approximately 150m length. Incorporating both the station plaza and station building creates a large area of at grade pedestrian crossing within the core of the Yanchep centre.

This scale of station cover (which is unique to the Yanchep Station) achieves many of the positive design elements of a

### STATION CRITICAL ELEMENT

### **DETAILS**

'underground tunnel' station design, but in a 'cut and cover' style station.

# Critical Element 5b: Transit Integration – Bus

Preferred: on street.

On street bus stops provide seamless access where they are able to be located directly outside stations. These can work well for city, strategic and town centre stations where there is a very frequent service and short wait times with no need for layover spaces. They may include a bay area and should provide shelter to improve passenger comfort or just a stop and information sign.

The bus station is located directly outside the station, at a perpendicular orientation to the station layout. This perpendicular orientation of the busway follows the street grid alignment of the adjoining development sites, allowing this to seamless form part of the street network.

These design elements are consistent with an 'on-street' bus stop design.

# **Critical Element 6: Station Type**

Preferred: integrated station

Integrated stations are fully integrated into the streetscape with station functions incorporated as appropriate to the context. Building may be multi-level, and form a seamless part of the urban streetscape, avoiding the creation of movement barriers. They require a portion of streetscape dedicated for entry ways to the station, and may have some functions at different levels.

The following design elements demonstrate that the Yanchep Station is best classified as an integrated station.

Integrated into the streetscape / form a seamless part of the urban streetscape

Multiple aspects of the station have been designed to appropriately interface with surrounding future development. This is best demonstrated in the Station Design Principles Plan at Figure 22 of this report.

# Avoid the creation of movement barriers

A direct movement line is created between the planned town square and main street west of the station, the station concourse and the planned priority pedestrian route east of the station (refer to the Station Design Principles Plan at Figure 22 of this report).

Streetscape to be dedicated for entry ways to the station

The east and west station entrances connect to the main street and pedestrian priority areas respectively. A station plaza space is provided immediately south.

# Critical Element 7a: Station Dedicated Parking

Preferred: no park'n'ride

Considered: no park'n'ride

The Yanchep station applies an 'at-grade park 'n' ride separated design', which is not recognised as either a preferred or considered form of parking for a strategic centre station precinct type.

As the Yanchep station is located in an emerging centre, and the centre itself is not set to achieve maturity for up to 50 years, this is considered an appropriate form of parking for this context. Opportunities to deliver a more consolidated

# STATION CRITICAL ELEMENT

# **DETAILS**

form of car parking will be reviewed as the activity centre development progresses.

The PTA has worked closely with METRONET Office and the adjacent developers to design the carpark internal road layout that may allow for future consolidation of the parking area to allow for future development lots. This would be subject to future planning and approvals.

Importantly, the station layout places this at-grade parking area with furthest distance from the station entrance to ensure opportunities for alternative travel are still explored and prioritised.

# Critical Element 8: Public Realm and Public Open Space

Preferred: people streets plaza/square, pocket park

The Yanchep station delivers a station plaza space immediately south of the station building. In addition, the station entrances are designed with high quality paving and landscape design, which is expected to align with the adjoining main streets and pedestrian network. This is consistent with the preferred design for a strategic centre station precinct.

### **7.3**. ASSESSMENT PROCESS AND APPROVAL REQUIREMENTS

# 7.3.1. Planning Control Area No. 130 (PCA130)

The proposed Yanchep Train Station works are wholly located within PCA130, which has been established for the purpose of facilitating the development of the land for the purpose of railways and related public purposes. Refer Figure 23 below.

The Planning and Development Act 2005 (PD Act) outlines the planning processes for a PCA. This process is summarised as follows:

- The development application is to be lodged with the local authority. The local authority is to forward the application and its recommendation to the WAPC within 30 days of receiving the application (Section 115(3) of the PD Act).
- The WAPC is to make a decision within 60 days of receiving the application (Section 250(3) of the PD

The declaration of a PCA results in the WAPC being the determining authority for a development application. It is also important to note that the Joint Development Assessment Panel approvals process is not required for a development application in a PCA.

Under Section 130 of the PD Act, the PCA provisions prevail over every other provision of the PD Act, including any region planning scheme or local planning scheme. However, this alone does not negate the requirement to obtain approval under the region planning scheme or local planning scheme, where applicable.

Figure 23 PCA Area Future Tore opango Ave PCA NO. 130 © 2020. Dept. of Planning WA; Landgate. Pr uced by Urbis Pty Ltd, Aug 2020 100 200 300 400 500 **LEGEND:** Planning Control Area **PLANNING CONTROL AREA** Indicative Station Envelope

# 7.3.2. Railway (METRONET) Act 2018

The Railway (METRONET) Act 2018 (METRONET Act) is the enabling legislation applicable to the construction of the METRONET railway extensions. Section 3 specifically provides the authority to construct the Yanchep Rail Extension. The legislation constitutes a special Act for the purposes of the Public Works Act 1902.

From a planning approvals perspective, this enabling legislation introduced a number of exemptions from planning approval beyond what is provided for within the PD Act and Metropolitan Region Scheme. Specifically, Section 6 of the METRONET Act provides the following exemption applicable to this application:

Despite anything in the Metropolitan Region Scheme, the following development may be commenced or carried out without the approval of the Planning Commission —

(B) METRONET works on non-railway land.

This clause will provide an exemption from planning approval for METRONET works which extend beyond the Railways reservation. Importantly, for the construction or alteration of a railway station, or any related car parks, public transport interchange facilities or associated means of pedestrian or vehicular access, the requirements under the Planning and Development Act 2005 and the Metropolitan Region Scheme will still apply.

For completeness and transparency, we have included detail on the full scope of works reasonably associated with the Yanchep Station within this application.

As this development application fundamentally involves the construction of a railway station, a development application is required. However, some works ancillary to the station will be exempt from approval under this clause. A detailed summary of the exemptions is provided at Section 7.3.5 of this report.

# 7.3.3. Section 6 of Planning and Development Act 2005 (Public Works)

Section 6 of the PD Act states provides exemption for the requirement to obtain planning approval under the relevant local planning scheme for 'public works' or the taking of land associated with that public work.

To achieve this public works test, the following two tests must be met:

- 1. The authority undertaking the work is an agent of the crown; and
- 2. The scope of works meet the definition of 'public work' as defined by the *Public Works Act 1902*.

The PTA is considered an 'Agent of the Crown', and the NEWest Alliance acts on behalf of the PTA. The proposed forward works will therefore meet the first test of public works.

Section 2 of the *Public Works Act 1902* includes the following within the definition of 'Public Work'.

- (2) any railway authorised by special Act or any work whatsoever authorised by any Act:
- (20) any road, stock route, viaduct, or canal;

Given the proposed Yanchep station works are included within the scope of the METRONET Act enabling legislation, the proposed works also meet this second test.

The Yanchep station works will thereby meet the Section 6 exemption, and does not require approval under the City's local planning scheme.

# 7.3.4. Metropolitan Region Scheme (MRS) Exemptions

The site is identified within the 'Central City Area' reservation MRS – refer to Figure 24. As noted earlier, the site is also located within PCA No. 130.

Section 24(2)(a) of the MRS applies to land which is zoned under the MRS, and specifically states that the exemptions for planning approval cannot be applied to land which is declared under Section 112 of the Planning and Development Act 2005 – i.e. a Planning Control Area. As a result, any works associated with the Yanchep train station which are not otherwise exempt by the METRONET Act will require approval under the MRS.

Indicative Station Envelope Existing Region Scheme Reserves © 2020. Dept. of Planning WA; Landgate. Produced by Urbis Pty Ltd, Aug 2020 Private recreation 100 200 300 400 500 Central city area Railways Bush forever area Other regional roads Urban Parks and recreation Urban deferred **METROPOLITAN REGION SCHEME** Primary regional roads

Figure 24 - Metropolitan Region Scheme (Extract)

# 7.3.5. Summary of Exemptions

The following table provides a summary of the METRONET Act and MRS exemptions, and associated conclusions regarding the scope of works which require formal development approval.

Table 9 - Summary of Exemptions

MRS Zone / Reservation	Exemption	Conclusion
'Central City Area' Zoning	Despite anything in the Metropolitan Region Scheme, the following development may be commenced or carried out without the approval of the Planning Commission —  (B) METRONET works on non-railway land.  'METRONET Works' are defined as: means works for the purpose of, or in connection with, a METRONET railway but	<ul> <li>The conclusion drawn from this clause is as follows:</li> <li>Station works which are available for public access or provide direct access to the station will require approval.</li> <li>Any other works included within the scope of this METRONET project will not require formal approval.</li> </ul>

MRS Zone / Reservation	Exemption	Conclusion
	does <u>not</u> include the construction or alteration of a railway station, or any related car parks, public transport interchange facilities or associated means of pedestrian or vehicular access;	As noted in Section 3.2.1 of this report, this exemption is determined to extend to the Yanchep Turnaround Facility immediately north of the station, as well as the 'road over rail' bridges to be constructed at Tokyu 3, Yanchep Beach Road and Toreopango Avenue.

### **PLANNING FRAMEWORK ASSESSMENT** 7.4.

# 7.4.1. State Planning Policy (SPP) Assessment Summary

The following table provides a high-level concluding assessment of the Yanchep Station against the key requirements and objectives of the State Planning Framework.

Table 10 State Planning Framework Assessment

STATE FRAMEWORK	DETAILS
Perth and Peel @ 3.5 Million (PP@3.5)  AND  North-West Sub- Regional Planning Framework (Sub- Regional Framework)	PP@3.5 and the associated Sub-Regional Framework identifies the Yanchep Station area as a 'Strategic Metropolitan Centre' within the surrounding land being Urban. This is consistent with the status of the site within the Metropolitan Region Scheme and State Planning Policy 4.2 – Activity Centres for Perth and Peel, and makes the Yanchep one of the highest order centre in the north west urban corridor, at par with Joondalup under the activity centres hierarchy.  The Sub-Regional Framework directly identifies the timely delivery of the YRE line including new Yanchep Station as an essential pre-requisite to achieving a high-density urban environment characterised by lower car dependency. The importance of the 'infrastructure first' model of urban development is therefore well established in the high level strategic planning framework. This approach enables the town centre to be defined by the railway station from day one, and ensures that movement and built form is defined holistically to the magnetism of the railway station.  The Sub-Regional Framework identifies all METRONET Stage 1 works within the framework, including the Yanchep Station. This proposal is therefore entirely consistent with the outcomes sought through the Sub-Regional Framework.
Metropolitan Region Scheme (MRS)	As noted in Section 7.3.4 above, the proposed Yanchep station will be located within the 'Central City Area' zone under the MRS, with the following intended function:  Strategic regional centres for major retail, commercial and office facilities as well as employment, civic, business and residential uses.  The construction of an interchange railway station within the 'City Centre' zone is entirely complementary with this function, as contemporary activity centre practices encourages built form and land use which does not solely the private

STATE FRAMEWORK	DETAILS
	vehicle. Placing the Yanchep Station within the activity centre unlocks these transport orientated development opportunities, which is widely accepted as best practice planning for a contemporary urban area.
State Planning Policy No. 7 – Design of the Built Environment (SPP7)	As identified in Section 7.1 of this report, the Yanchep Station appropriately addresses the relevant design principles of SPP7, and has been the subject of SDRP comment consistent with this policy.
State Planning Policy No. 4.2 – Activity Centres for Perth and Peel (SPP4.2)	<ul> <li>The Yanchep Station is located within the Yanchep Activity Centre, which is identified as an 'emerging' Strategic Metropolitan Centre under the activity centres hierarchy of SPP4.2.</li> <li>Key themes and objectives of SPP4.2 which are directly applicable to this development application are as follows: <ul> <li>Accessibility to public transport, and planning in line with transit oriented development principles.</li> <li>Prioritising mode-shift towards public transport, walking and cycling, and reducing reliance on private cars.</li> </ul> </li> <li>The design principles outlined in preceding sections of this report have demonstrated the various ways in which the Yanchep Station has met these</li> </ul>
State Planning Policy No. 5.4 – Road and Rail Noise (SPP5.4)	objectives.  SPP5.4 guides the interface of noise sensitive development and major road and rail transport routes, with the overall aim of protecting significant transport routes whilst minimising the adverse impact of transport noise on sensitive development.  As all new proposed railways are required to meet the specified noise targets of SPP5.4, a noise and vibration assessment has been completed in support of the Yanchep Station (refer to <b>Appendix J</b> of this report).  Importantly, the PTA has also committed to undertaking further operational modelling to ensure the modelled noise outcomes are accurate (refer to
	Section 6 of this report).  As the area immediately surrounding the train station is currently undeveloped, the provisions of SPP5.4 will also apply to any new noise sensitive development proposed within 100m of the rail alignment, which will likely result in 'quiet house' design standards being applied to this subsequent development.  This 'belt and braces' approach to noise mitigation effectively meets the objectives of SPP5.4.
Development Control Policy No. 1.6 – Planning to Support Transit Use and	The key objective of DCP1.6 is to encourage the co-location of development and transportation, to serve the mutual benefit of increasing patronage on the public transport system, as well as decreasing reliance on the private vehicle.  The Yanchep Station indisputably supports transit orientated development principles (TOD), given it provides a multi-modal station with the core of a

STATE FRAMEWORK	DETAILS		
Transit Oriented Development (DCP1.6)	future secondary level activity centre. But the detailed station design remains an important component to ensuring these TOD principles come to fruition.		
	In summary, the following design components of the Yanchep Station support TOD principles:		
	<ul> <li>The modal hierarchy of the station design places active modes of transport first, and locates long-term parking to the periphery of the station precinct.</li> </ul>		
	<ul> <li>The co-location of the bus interchange and station building, combined with a comprehensive future bus network makes multi-modal trips more desirable for passengers.</li> </ul>		
	<ul> <li>The station will ultimately be supported by a main street connection to the west of the station building, and a priority pedestrian route to the east.</li> </ul>		
	Combined, these supporting measures expand the reach of TOD beyond simply development in proximity to the station, and creates real opportunities to decrease car dependence.		

# 7.4.2. Yanchep City Centre Activity Centre Plan No. 100 (Yanchep ACP)

Earlier sections of this report have determined that the proposed development meets the categorisation of 'Public Works' and is exempt from a local planning framework assessment under Section 6 of the Planning and Development Act 2005. Regardless, as the interface between the Yanchep Train Station and surrounding Yanchep Strategic Metropolitan Centre is an essential consideration in the successful station planning design, the driving principles and objectives of the have been considered for this application.

The Yanchep ACP was endorsed by the WAPC in March 2018, and forms the primary guiding planning framework for the Yanchep Strategic Metropolitan Centre. The ACP covers an area of approximately 106ha, generally enclosed by the Yanchep Beach Road to the south, Toreopango Avenue to the north, Marmion Avenue to the west and the future Mitchell Freeway alignment to the east.

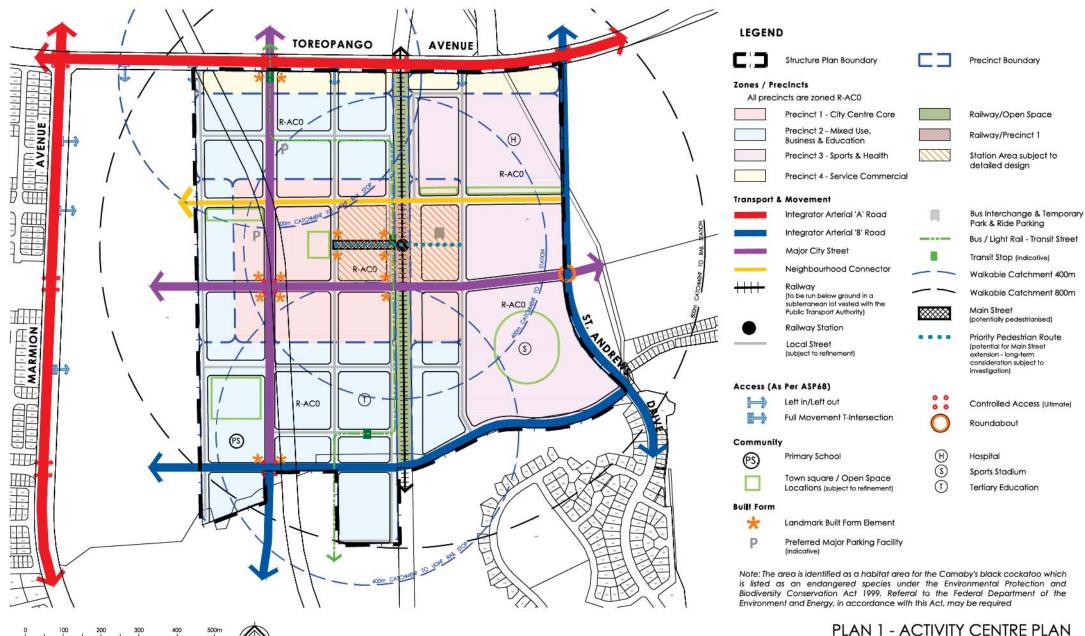
The overall Yanchep Activity Centre Plan is displayed at Figure 25 below. This plan has been used to inform the Yanchep Station interface with the Yanchep Activity Centre, as demonstrated in the ple Plan within Section 7.1 of this report.

The overarching objective of the Yanchep ACP is to deliver a diverse retail, commercial, service, cultural, leisure and educational uses supported by high density development. This includes a direct objective to concentrate the highest intensity land uses around the railway station, with the driving intent of delivering a transport oriented, highly urban environment.

The ultimate development outcomes for the Yanchep Strategic Metropolitan Centre are envisioned to occur in stages over a 50-year horizon. Whilst this is a long-term horizon, the Yanchep Station design will still need to cater to the activity centre at its maturity, as the opportunity to undertake major upgrades to an operational train station are limited.

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The Yanchep train station will be located within the 'City Centre Core' precinct, which is envisioned to form a vibrant mixed use and highly concentrated urban area, with primary focus on pedestrian movements particularly along the designed main street. Table 11 below outlines the direct outcomes sought through the Yanchep ACP, as they apply to the Yanchep Station, and demonstrates that the Yanchep Station building design and overall station precinct layout will appropriately align and support the objectives of the Yanchep ACP.

Table 11 Yanchep ACP Summary

Zone / Precinct / Layer	Details
Main Street	The main street extends west of the Yanchep Station building, and provides a connection between the future town square and the station building. This main street is intended to function as the central and primary focus for activity and pedestrian movements.  The Yanchep Station layout caters to this intent by providing an at-grade
	station building entrance and western entry point to link with this main street.
Priority Pedestrian Route	The priority pedestrian route forms an east-west connection uniting east and west of the Station Area. This priority pedestrian route is intended to function as a dedicated movement network where pedestrian movements are given priority.
	The Yanchep Station design encourages this free east-west movement by providing an at grade station cap over the railway line, as well as a non-fare pathway through the station building. The allowance for a future development site immediately east of the station building will complement this movement, as it is expected that this will accommodate high quality active uses.

# 8. CONCLUSION

The METRONET Yanchep Rail Extension from Butler Station to Yanchep sets out to implement best practice urban design and transport planning principles to the emerging north west corridor of Perth. The Yanchep Station is an exceptional example of this approach, which by placing the Yanchep multi-modal station within the planned Yanchep Strategic Metropolitan Centre creates the foundations for successfully achieving transport orientated development, and embedding opportunities for urban development without creating sole reliance on the private vehicle.

The successful application of transport oriented development extends beyond simply placing a train station within an activity centre. Thereby a well designed multimodal station also requires careful consideration of desire lines, aswell as convenience and opportunities for engagement with the activity centre. This report concludes that the Yanchep Station achieves these essential pillars of a contemporary multimodal station, as evidenced through the following:

- A pedestrian first approach to the station building design. Specifically, the 'cut and cover' design of the Yanchep Station creates an 'at-grade' entrance experience to the station concourse, and enables the station building and adjacent forecourt to form a seamless link across the railway line.
- The co-location of the bus interchange and station building reduces the total journey time for multimodal trips, making bus-to-train transport a more practical and convenient option for patrons. The Yanchep Station incorporates the station plaza as part of this connection, which both increases the size of the railway capping structure, as well as increasing activity in this area. This spatial layout is unique to the Yanchep Station for the YRE line.
- Providing essential pedestrian connecting infrastructure, including an extension of the existing PSP network from Butler Station to Yanchep Station.
- Recognising the need for park-and-ride facilities for a train station in an emerging urban centre, but
  deliberately locating these facilities beyond the immediate station precinct. This approach
  encourages movement through the activity centre on the way to and from the station, as well as
  reducing the number of vehicle movements within the immediate station area.
- Opportunities to integrate future activity centre development within the station precinct have been
  maximised for the Yanchep Station, in recognition that the Yanchep Strategic Metropolitan Centre is
  the highest order activity centre for the YRE line stations. This initiative provides multiple
  opportunities for the train passengers to interact with the future activity centre.

Whilst the development application is for 'public works' and has limited statutory assessment controls, this has in no way resulted in a compromised design outcome for the Yanchep Station. As demonstrated via a planning assessment against the qualitative controls of SPP7, the METRONET Station Design Guide and other relevant State and local planning frameworks, the Yanchep Station is designed to be fit for purpose, and will be the catalyst for further supporting high quality development within Yanchep.

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This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

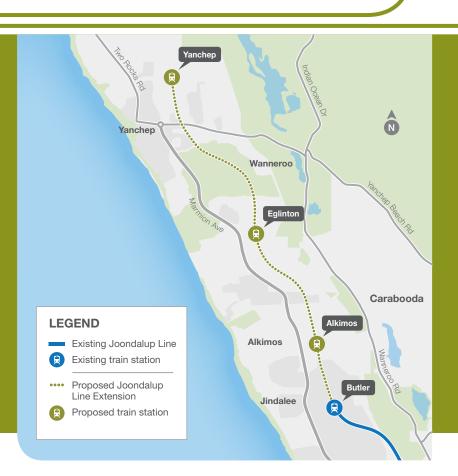
# **APPENDIX A**

# **SUMMARY OF METRONET YRE PROJECT AND YANCHEP STATION**



# Yanchep Rail Extension

The 14.5 kilometre Joondalup Line extension is essential in managing the planned growth of Perth's northern suburbs, addressing road congestion and creating the focus for progressive mixed use development that will provide local amenity, services and employment.



# The project addresses three key local issues:



Worsening urban congestion due to a lack of efficient transport alternatives.



Continued land development that promotes private vehicle use and limits opportunities to create higher density residential areas.



Social inequality and lower levels of opportunity for people who do not own or are unable to use a private vehicle.

# Project snapshot\*

**19,440** Total daily boardings (2031)

**2,000** Total parking bays

Train journey from Perth to Yanchep

30 Total u-rails and

□ 30 Total bus stands

Joondalup Line extension

5 Fauna underpasses

**13.8** Prir

Principal-shared path

9

Road-over-rail bridges

**3** 

New stations at Alkimos, Eglinton and Yanchep



Bus stowage depot at Alkimos



Modifying Butler Station into a through station

\*Final details are subject to detailed design and may change.









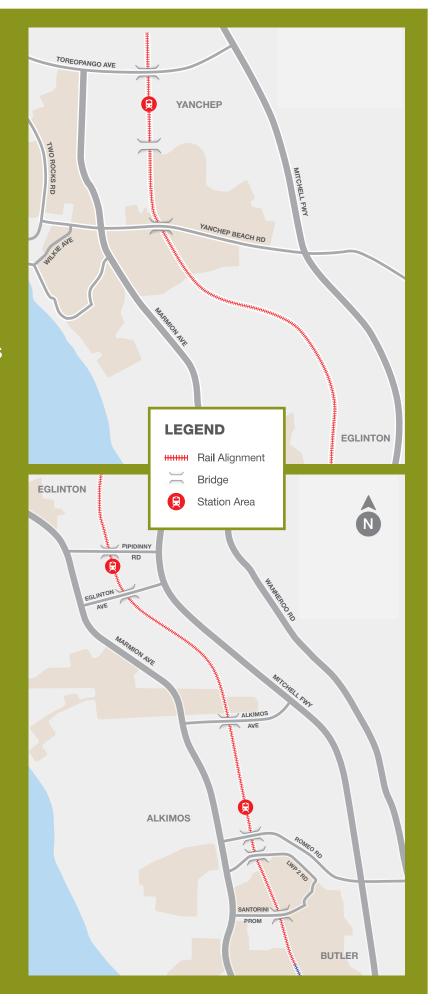
# Rail alignment

The majority of the 14.5 kilometre rail extension will be in a cutting to support community connections and integration, reduce noise and improve overall amenity.

The Yanchep Rail Extension will deliver nine road-over-rail bridges, which will also support access and early staging of development around the stations. Eleven potential crossings are identified along the route as part of longer term development intentions. These have been future proofed in the design, but are subject to further planning and delivery by third parties.

The rail alignment will travel through some Parks and Recreation sites and a Bush Forever area. While every effort was made to avoid these areas, including careful consideration of alternative alignments, the undulating landscape, tight rail curve (not conforming to strict railway design standards) and impact on existing and future residents meant this was not viable.

One Parks and Recreation site will have a fauna underpass and four fauna underpasses will be built through the Bush Forever area. In these areas every effort will be made to minimise impacts.



# The Project

The Yanchep Rail Extension's transport infrastructure will be delivered by the Public Transport Authority and includes:



14.5 kms of new dual-track to extend the Joondalup Line.



Alkimos Station with a cut-and-cover tunnel construction, including parking, bus interchanges, passenger amenities and cycling facilities to cater for approximately 3,616 daily boardings (2031) and offering an approximate 41-minute journey to Perth.



Eglinton Station including parking, bus interchanges, passenger amenities and cycling facilities to cater for an estimated 4,792 daily boardings (2031) and offering an approximate 46-minute journey to Perth.



Yanchep Station with a cut-and-cover tunnel construction, including parking, bus interchanges, passenger amenities and cycling facilities to cater for an estimated 11,032 daily boardings (2031) and offering an approximate 49-minute journey to Perth.



Two stow roads north of Yanchep Station for four sixcar trains.



Nine roadover-rail bridges.



New bus stowage depot at Alkimos.



Noise and vibration mitigations measures.



Modifying Butler Station into a 'through' station.



13.8 kms of new shared path for cyclists and pedestrians adjacent to the rail line.

As a result of the integrated METRONET approach the Yanchep Rail Extension will also promote and encourage higher-density development surrounding the stations.

The METRONET Office will continue to work closely with stakeholders and landowners to ensure planning for these new urban centres makes the most of the public transport infrastructure.

# Walk, cycle, bus and share

While ample parking will be provided, the Yanchep Rail Extension will look to encourage passengers to access the stations by walking, cycling, bus and drop-off.

The METRONET Office is working with stakeholders to plan the area around the station with a diverse mix of uses and density that support walkable communities that are safe and accessible.

Along the western side of the rail extension will be a 13.8 kilometre principal shared path (PSP) that will follow the natural ground levels, except where it passes under road bridges, to ensure a continuous and safe option for pedestrians and cyclists. This path will be connected to existing local pathways and to the future stations.

Each station will have dedicated passenger drop-off areas, secure bicycle parking shelters, bike u-rails and the ability to add additional secure bicycle parking shelters in the future.

The area's existing bus services will be reviewed to create a comprehensive feeder bus network that will see routes 'loop' between train stations. Final service details will be determined closer to when rail operations begin following detailed planning and community consultation.

# Minimising noise and vibration

To minimise noise and vibration impacts on the surrounding proposed residential developments, the majority of the Yanchep Rail Extension will be in a cutting. Other measures to be investigated when the contractor is appointed include:

- noise walls;
- ballast matting;
- encouraging developers neighbouring the railway to have appropriate setbacks from the rail reserve via road reserves or public open space; and
- encouraging homes yet to be built in the 'first row' facing the route to implement 'quiet house design'.

# TIMELINE Transport infrastructure delivery



# Land development delivery

**Transport** projects can be planned and delivered in a relatively defined timeframe.

However, the associated development around a station can take 30 to 40 years (or longer) to reach target densities and is often not within the State Government's control. In addition, land uses are impacted by planning, investment and policy factors beyond the investment in transport infrastructure alone.

For the Yanchep Rail Extension, the METRONET Office will continue to work with state agencies, local governments and the private sector to help transition the areas around Alkimos, Eglinton and Yanchep stations into mixed-use centres over time.

# Planning history in Perth North-West sub-region

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Identifies the Perth Metropolitan Northwest Corridor as attractive for urban development due to its undulating well drained soils, proximity to Indian Ocean and substantial lifestyle and climatic advantages for housing.

Identifies the northern urban growth extent of Perth to Yanchep-Two Rocks.

# Metroplan

Triggers review of Corridor Structure Plan.

# Yanchep-Two Rocks **District Structure Plan**

Identifies Yanchep-Two Rocks as the largest single urban development project in Perth.

Identifies an ultimate population of 155,000 or 2 - 3% of Australia's population growth over the next 40 years.

Identifies opportunity for 55,000 new jobs within the district or almost one job per household.

# Alkimos Eglinton **District Structure** Plan

Identifies an ultimate population of more than 57,000 residents.

Clever, transit oriented development with sustainability at the heart of its design and central to residents' way of life.

0

Establishes a structure plan to guide development in the Northwest Corridor, including the Alkimos to Yanchep subregion.

Planning Structure for the Northwest

Identifies the strategic significance S 66 of Alkimos.

Identifies the importance of a passenger rail system to connect and service this growth corridor.

Identifies rail alignment to be deviated away from the freeway reserve to service greenfield commercial centres north of Butler.

**North West Corridor** Structure Plan

5 201 The framework acknowledges delivering a high-density urban environment, characterised by lower car dependency and strategic employment opportunities, is dependent on providing essential supporting infrastructure, such as the extension of passenger rail to Alkimos, Eglinton and Yanchep.

**Draft North-West Sub-regional** Planning Framework

# MORE INFORMATION

⊠ info@metronet.wa.gov.au

**%** 9326 3666

metronet.wa.gov.au





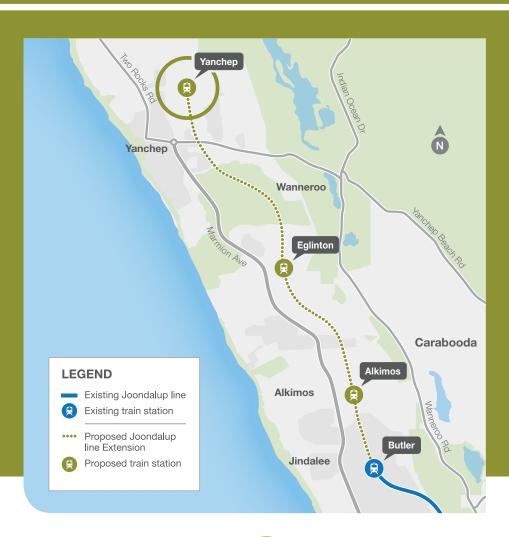




# Yanchep Station

Yanchep Station will be approximately 49 minutes from the CBD by train and will become the heart of Perth's newest strategic business centre.

The station's future-proof design provides land development opportunities, while meeting passenger needs from day one of operations. It will be built in a cutting, with a cut and cover tunnel approach to provide ground-level connections in an unpaid concourse area to each side of the railway.



# **Station** snapshot\*



49 min

Journey to Perth



Parking bays



Bus stands



Passenger toilets



motorcycle bays 10 + 2

U-rail

Bike shelters



Lifts and stairs



Universal access

# Location

At the end of the Joondalup Line,
Yanchep Station will be located south of the future Toreopango Avenue, north of Yanchep Beach Road, east of Marmion Avenue and west of Wanneroo Road, positioning it centrally to the future Yanchep City Centre's main retail and commercial areas.

<sup>\*</sup>Final details are subject to detailed design and may change.







# Station design

The early station design work looked into the location, scale and general features of the future station. This work detailed how the end-of-line station fits within the planned development and caters for passengers transferring between trains and a feeder bus network.

A ground-level concourse and station building will include an unpaid zone to connect both sides of the development, with two platforms located in a cutting.



# Features of the universally accessible station:





Passenger amenity

Public toilets, public services (such as vending machines), kiosk, passenger ticketing/information, staff amenities, station administration offices, storage/cleaning and operational facilities.



Pedestrian/ cycle access Well connected to a principal-shared path west of the station, with two secure bicycle parking shelters, bike u-rails and ability to add two additional secure bicycle parking shelters in the future.



Bus interchange

14 stands with weather protection, seating and information facilities. Its flexible design could see buses dropping off passengers either internally to the bus station or externally next to commercial development to maximise the surrounding development potential. The interchange includes seven layover bays.



Vehicle

Dedicated passenger drop-off area and approximately 1,000 parking bays.

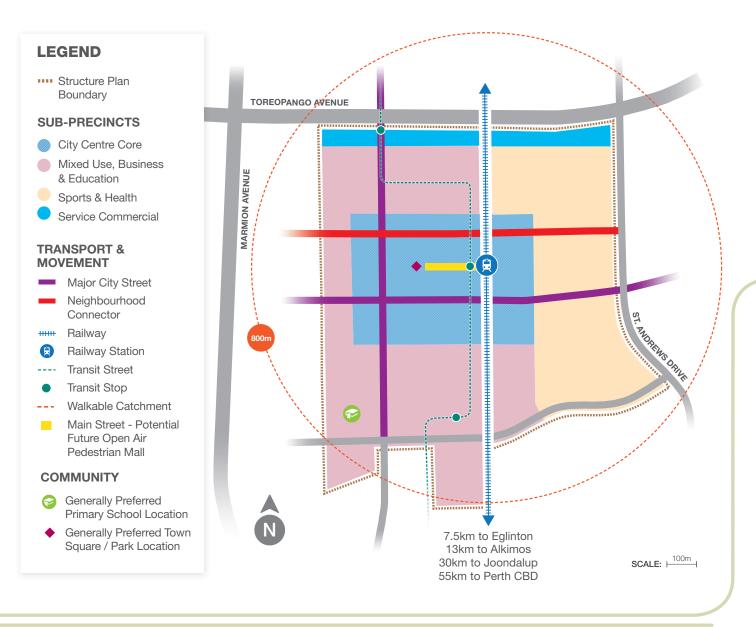
The station architecture and final design will be developed when a contractor is appointed.



# Precinct development

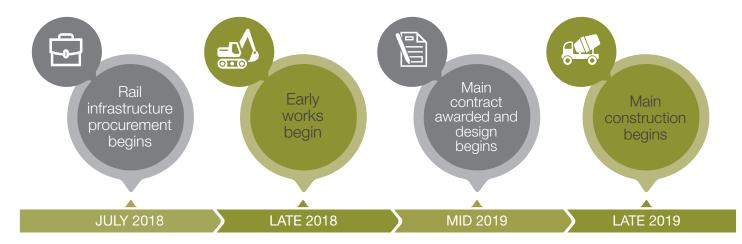
Classed as a 'city' type area, the walkable area around the station covers most of the planned Yanchep City Centre, which will be progressively developed on land privately owned by the Yanchep Beach Joint Venture (YBJV).

The METRONET Office has collaborated with YBJV to ensure the proposed design supports the State Government and landowner's vision for the area. Once fully developed, Yanchep will provide a full range of economic and community services. This includes strategic employment and regional facilities to serve the growth planned in Perth's northern corridor.



# TIMELINE

# Transport infrastructure delivery



# Yanchep Station Precinct Planning Phase

Structure Plan	In development	Lodged	Advertised	Modified	Approved
Subdivision (Stage 1 Station Precinct)	Further Information	Lodged	Conditionally Approved	Conditions Satisfied	Titles Issued
S Land Sales	Lots released to market	Offer & Acceptance	Settlement		Lots sold
Development	Conceptual Design	DA Lodged	DA Assessment (WAPC)	DA Approved	Construction & Occupation

About the project

METRONET's Yanchep Rail Extension extends the Joondalup Line 14.5 kilometres north with new stations at Alkimos, Eglinton and Yanchep. Connected by a 13.8 kilometre principal shared path, nine road-over-rail bridges and a comprehensive bus feeder network, the project is the catalyst for progressive mixed use development around each station that will provide local amenity, services and employment.

# **MORE INFORMATION**

⊠ info@metronet.wa.gov.au

9326 3666

metronet.wa.gov.au







# APPENDIX B CERTIFICATES OF TITLE





# AUSTRALIA

REGISTER NUMBER

N/A

DUPLICATE DATE DUPLICATE ISSUED
EDITION
1 13/12/2018

VOLUME

2959

FOLIO

378

# RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

# THIS IS A SHARE TITLE

### LAND DESCRIPTION:

1/2 UNDIVIDED SHARES OF LOT 9 ON DEPOSITED PLAN 415221

# REGISTERED PROPRIETOR:

(FIRST SCHEDULE)

ST ANDREWS PRIVATE ESTATE PTY LTD OF LEVEL 4, 225 ST GEORGES TERRACE PERTH WA 6000 AS SOLE PROPRIETOR OF THE SHARE SHOWN IN THE LAND DESCRIPTION

(AF O039024) REGISTERED 13/12/2018

# LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:

(SECOND SCHEDULE)

1.	EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER
	1466/1928.

	1400/1928.	
2	*G407785	MEMORIAL TOWN PLANNING AND DEVELOPMENT ACT 1928 REGISTERED 27/2/1997

3.	*G407786	MEMORIAL. TOWN PLANNING AND DEVELOPMENT ACT 1928. AS TO PORTION ONLY - SEE
		DEPOSITED PLAN 415221 REGISTERED 27/2/1997.

- 4. \*G407802 MEMORIAL. TOWN PLANNING AND DEVELOPMENT ACT 1928. AS TO PORTION ONLY SEE DEPOSITED PLAN 415221 REGISTERED 27/2/1997.
- 5. \*G407777 MEMORIAL. TOWN PLANNING AND DEVELOPMENT ACT 1928. AS TO PORTION ONLY SEE DEPOSITED PLAN 415221 REGISTERED 27/2/1997.
- 6. J723740 EASEMENT TO WATER CORPORATION FOR WATER SUPPLY PURPOSES SEE DEPOSITED PLAN 415221 REGISTERED 2/5/2006.
- 7. J723743 EASEMENT TO WATER CORPORATION FOR WATER SUPPLY PURPOSES SEE DEPOSITED PLAN 415221 REGISTERED 2/5/2006.
- 8. J723744 EASEMENT TO WATER CORPORATION FOR WATER SUPPLY PURPOSES SEE DEPOSITED PLAN 415221 REGISTERED 2/5/2006.
- 9. J723745 EASEMENT TO WATER CORPORATION FOR WATER SUPPLY PURPOSES SEE DEPOSITED PLAN 415221 REGISTERED 2/5/2006.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.

\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.

Lot as described in the land description may be a lot or location.

END OF PAGE 1 - CONTINUED OVER



# RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: N/A VOLUME/FOLIO: 2959-378 PAGE 2

-----END OF CERTIFICATE OF TITLE------

### **STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP415221 PREVIOUS TITLE: 2959-375

PROPERTY STREET ADDRESS: 146K TOREOPANGO AV, YANCHEP.

LOCAL GOVERNMENT AUTHORITY: CITY OF WANNEROO

NOTE 1: I197180 SECTION 138D TLA APPLIES TO CAVEAT H659592 - AS TO THE PORTION OF THE

WITHIN LAND FORMERLY COMPRISED IN VOLUME 2587 FOLIO 252 ONLY.





# AUSTRALIA

REGISTER NUMBER

N/A

DUPLICATE DATE DUPLICATE ISSUED

1 13/12/2018

VOLUME

2959

FOLIO

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REGISTRAR OF TITLES

# THIS IS A SHARE TITLE

### LAND DESCRIPTION:

1/2 UNDIVIDED SHARES OF LOT 9 ON DEPOSITED PLAN 415221

# **REGISTERED PROPRIETOR:**

(FIRST SCHEDULE)

NEW ORION INVESTMENTS PTY LTD OF CARE OF MOORE STEPHENS, LEVEL 3, 12-14 ST GEORGES TERRACE, PERTH

AS SOLE PROPRIETOR OF THE SHARE SHOWN IN THE LAND DESCRIPTION

(AF O039024) REGISTERED 13/12/2018

# LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:

(SECOND SCHEDULE)

1.	EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER
	1466/1928.

2	*G407785	MEMORIAI	TOWN DI	ANNING AND	DEVELOPMENT	ACT 1028	<b>REGISTERED 27/2/1007</b>

<sup>3. \*</sup>G407786 MEMORIAL. TOWN PLANNING AND DEVELOPMENT ACT 1928. AS TO PORTION ONLY - SEE DEPOSITED PLAN 415221 REGISTERED 27/2/1997.

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END OF PAGE 1 - CONTINUED OVER



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NOTE 1: I197180 SECTION 138D TLA APPLIES TO CAVEAT H659592 - AS TO THE PORTION OF THE

WITHIN LAND FORMERLY COMPRISED IN VOLUME 2587 FOLIO 252 ONLY.







Document number

Lodgement date

O438415 30/06/2020 14:00:59

Caveat

The information in this form is collected under statutory authority and used for the purpose of maintaining publicly searchable registers and indexes.

Jurisdiction

Western Australia

Legislation

Transfer of Land Act 1893

Document details

ELN id

Document type Caveat ELN lodgement 204826445

PEXA case id

ELN workspace 4686583 ELN document id 550925438

ELN counterpart 550925438-259609983

id/s

Responsible subscriber and contact details

Name DEPARTMENT OF JUSTICE Contact fax 08 9264 1440

Customer code EFA18790 Contact phone 08 9264 1176

Contact name Gayle Elizabeth Ferguson Contact email

Contact address DAVID MALCOLM JUSTICE CENTRE Client reference 4599-19 MC1

28 BARRACK STREET PERTH WA

6000

Lodgement fees

 Fee description
 Net
 Gst
 Fees

 ELNO - Caveat
 \$174.70
 \$0.00
 \$174.70

 Total
 \$174.70

Operative clause

The caveator claims the Estate or Interest specified in the Land on the Grounds set out herein and forbids the registration of any Instrument affecting the Estate and Interest to the Extent of Prohibition as specified.

Land

Title(volume-folio) Extent Land description Estate and/or interest

2959-378 Part 1/2 UNDIVIDED SHARE OF THOSE PARTS OF FEE SIMPLE

LOT 9 ON DEPOSITED PLAN 415221 AS ARE: (A)
DELINEATED AND MARKED 'YRE' AND
'YANCHEP RAIL EXTENSION ON THE PLAN
MARKED C1 ANNEXED HERETO: (B)

MARKED C1 ANNEXED HERETO; (B)
DELINEATED AND MARKED 'YANCHEP
STATION BUS INTERCHANGE' ON THE PLAN
MARKED C2 ANNEXED HERETO; AND (C)
DELINEATED AND MARKED 'CAVEAT AREA' ON
THE PLAN MARKED C3; ANNEXED HERETO

2950-643 Part 1/2 UNDIVIDED SHARE OF THAT PART OF LOT FEE SIMPLE

9101 ON DEPOSITED PLAN 406263 AS IS DELINEATED AND MARKED 'YANCHEP RAIL EXTENSION' ON THE PLAN MARKED C4

ANNEXED HERETO

O438415 Page 1 of 2 CAV001

### Caveator/s

WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC)

### Estate and interest being claimed

Equitable Interest as Purchaser of the Fee Simple

### Grounds of claim

Claim statement Purchaser's contract with the following Parties and Date

Parties ST ANDREWS PRIVATE ESTATE PTY LTD (ACN 118004158)

WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC)

Date 29/06/2020

# Extent of prohibition

Absolute

### Service of notice to the caveator/s

Address DAVID MALCOLM JUSTICE CENTRE 28 BARRACK STREET PERTH WA 6000

# Registered proprietor/s

O438415

ST ANDREWS PRIVATE ESTATE PTY LTD (ACN 118004158) OF LEVEL 4 225 ST GEORGES TERRACE PERTH

### Subscriber Certification and Execution on behalf of Caveator/s

DEPARTMENT OF JUSTICE (ABN 70598519443) makes the following certifications:

- The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
- 2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
- The Certifier has taken reasonable steps to verify the identity of the caveator or his, her or its administrator or attorney.

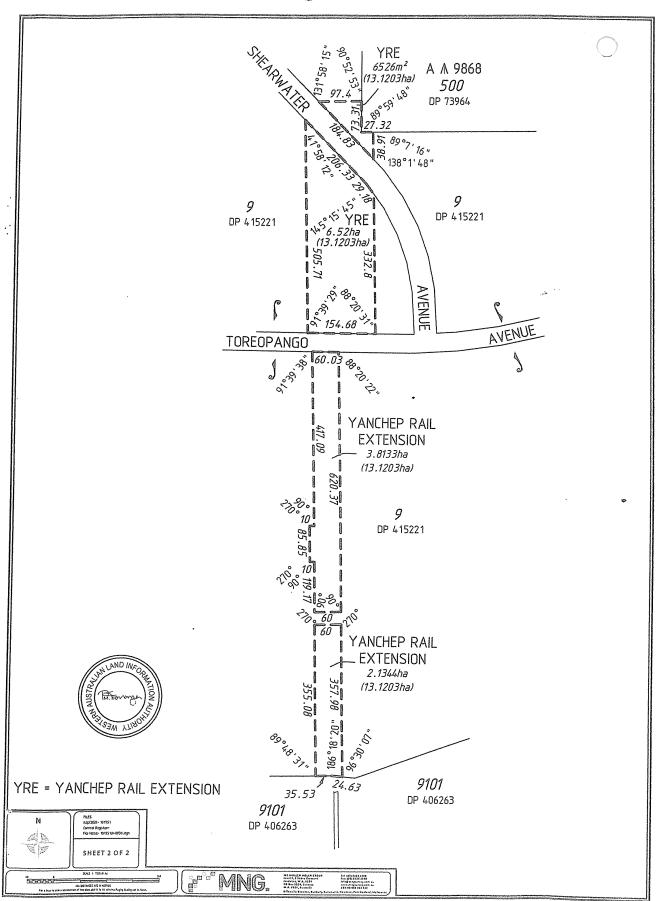
Digitally signed by GAYLE ELIZABETH FERGUSON for DEPARTMENT OF JUSTICE (ABN 70598519443) on behalf of WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC) on 30 June 2020

Page 2 of 2

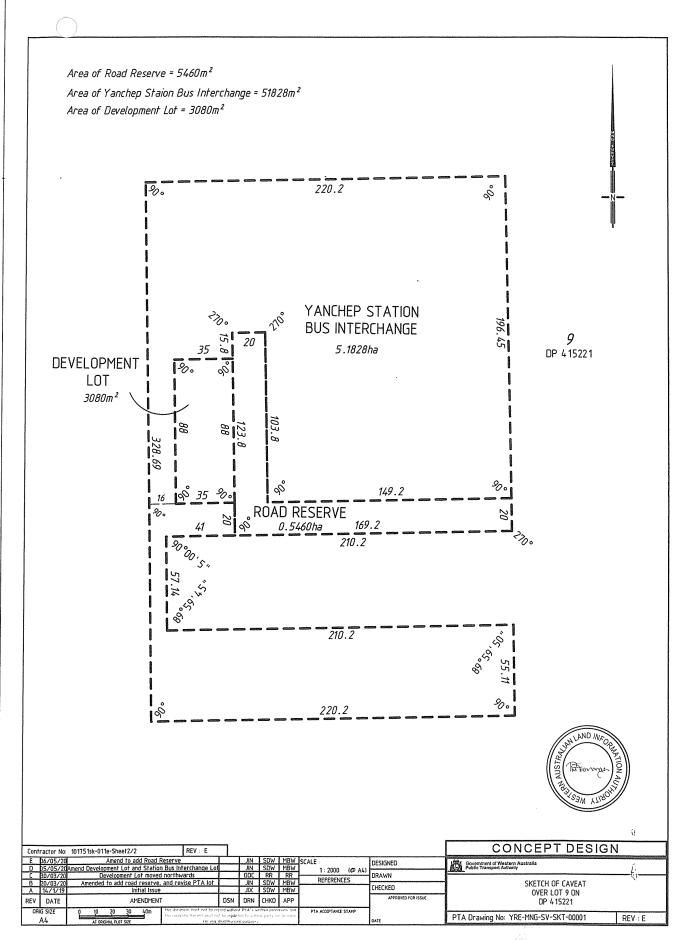
**CAV001** 

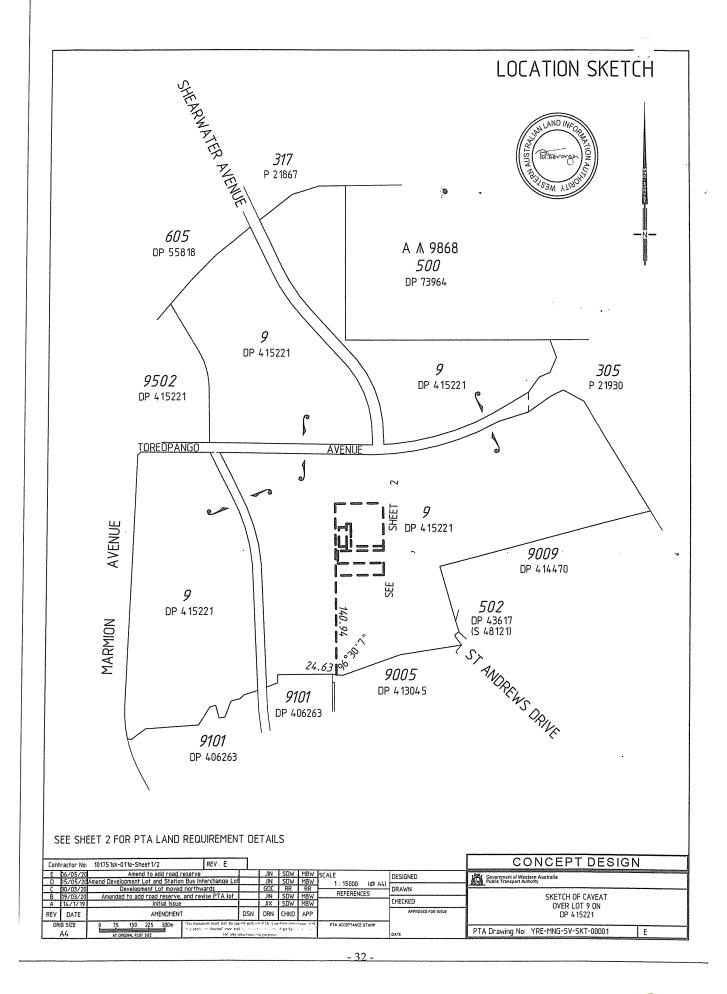
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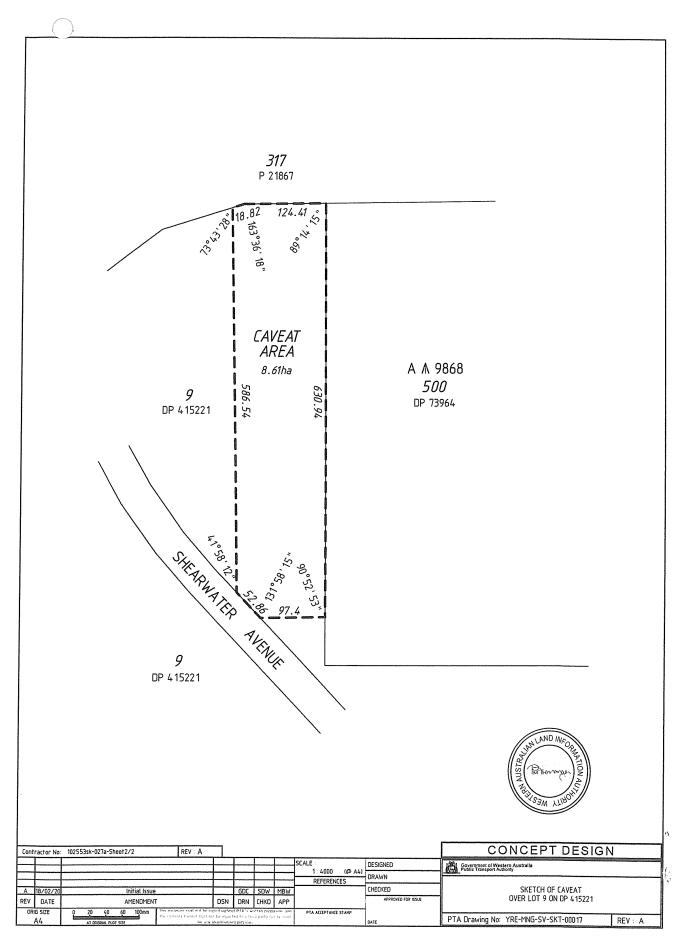
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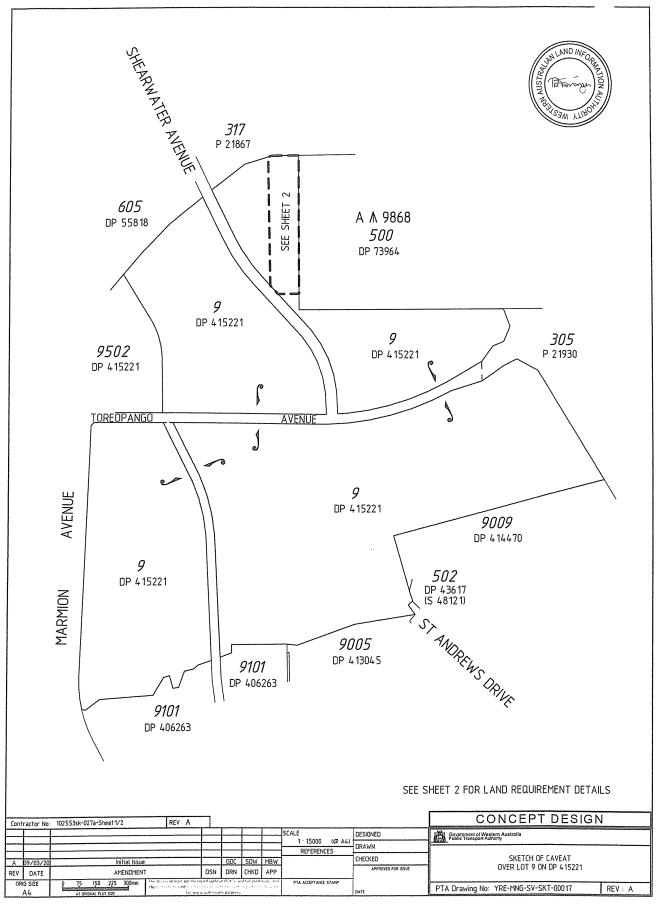


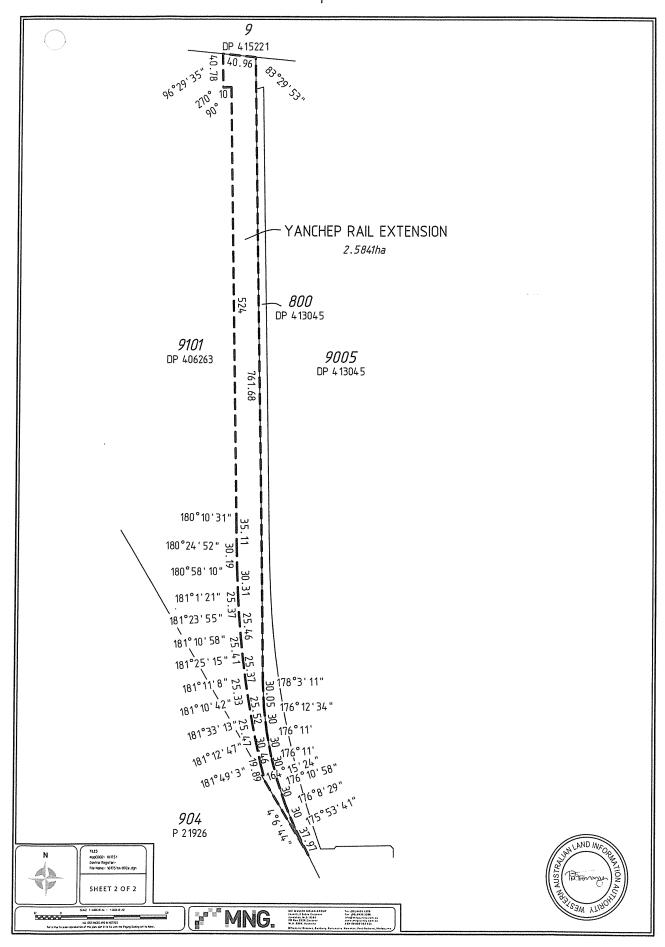
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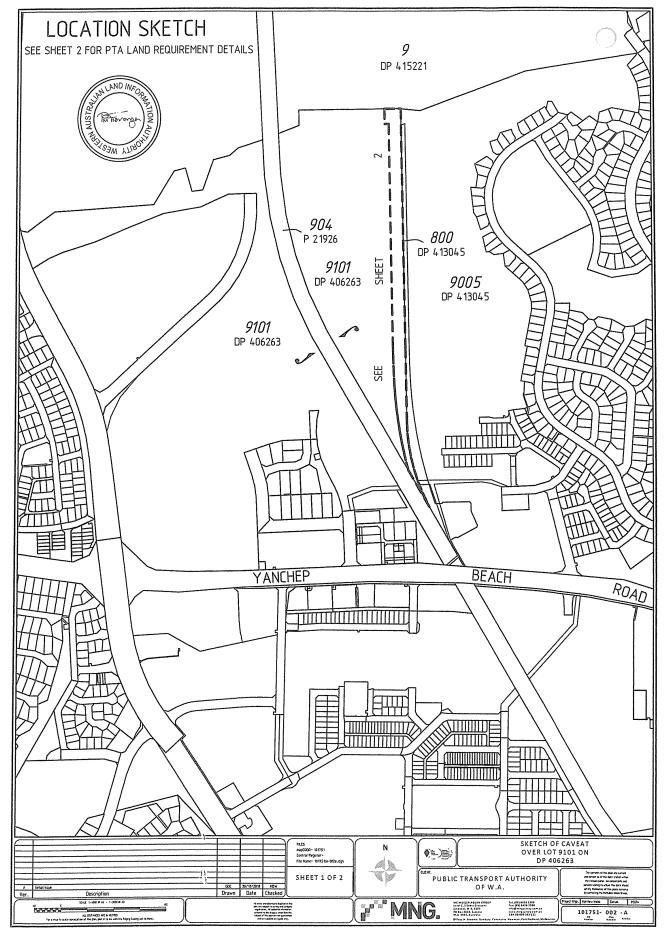
















ST ANDREWS PRIVATE ESTATE PTY LTD LEVEL 4 225 ST GEORGES TCE PERTH. WA 6000

Dear Sir/Madam

I advise that a caveat has been lodged against the Certificate of Title for your land. Your land ownership details are described in the schedule overleaf.

Some details of the Caveat including a copy of part of the "Estate or interest claimed" section are shown in the schedule overleaf.

A caveat is a statutory notice lodged against the Certificate of Title for the land evidencing a claim to an interest in that land. The claim is made by a person who is not the registered owner of the land. The person claiming the interest in the land is known as the caveator.

The existence of a caveat on the title does not allow the caveator to deal with the land, however the caveat may prevent the registration of any change to the title for the land until notice of that change has been given to the caveator.

The caveat will remain on the title until it is withdrawn by the caveator or action is taken for its removal.

A complete copy of the caveat may be obtained (on payment of the prescribed fee) at www.landgate.wa.gov.au. If you wish to seek further information regarding the caveat, be contacted on +61 (0)8 9273 7373 or by email to customerservice@landgate.wa.gov.au. Please be aware that legal advice cannot be provided. Customers requiring any legal advice must seek their own independent legal advice.

Finally, please note that, due to the numbers of caveats lodged daily at the Western Australian Land Information Authority (Landgate), the Registrar of Titles is personally not able to assist you with caveat enquiries.

Sincerely,

JEAN VILLANI

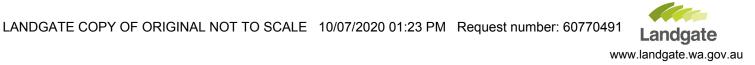
REGISTRAR OF TITLES







Caveat No:	O438415
Caveator:	WESTERN AUSTRALIAN PLANNING COMMISSION
Nature of Claim:	ABSOLUTE
Affected Titles:	2950-643,2959-378
Affected Documents:	
Estate/Interest Claimed:	CLAIM CATEGORY: AGREEMENT/CONTRACT CLAIM STATEMENT: EQUITABLE INTEREST AS PURCHASER OF THE FEE SIMPLE







ST ANDREWS PRIVATE ESTATE PTY LTD LEVEL 4 225 ST GEORGES TCE PERTH. WA 6000

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Sincerely,

JEAN VILLANI

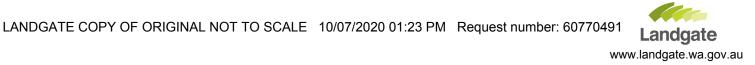
REGISTRAR OF TITLES







Caveat No:	O438415
Caveator:	WESTERN AUSTRALIAN PLANNING COMMISSION
Nature of Claim:	ABSOLUTE
Affected Titles:	2950-643,2959-378
Affected Documents:	
Estate/Interest Claimed:	CLAIM CATEGORY: AGREEMENT/CONTRACT CLAIM STATEMENT: EQUITABLE INTEREST AS PURCHASER OF THE FEE SIMPLE









Document number Lodgement date

30/06/2020 14:00:59

Caveat

The information in this form is collected under statutory authority and used for the purpose of maintaining publicly searchable registers and indexes.

Jurisdiction

Western Australia

Legislation

Transfer of Land Act 1893

Document details

ELN id

Document type ELN lodgement 204826445 Caveat

case id PEXA

ELN document id 550925377

**ELN** workspace 4686583

ELN counterpart 550925377-259609983

Responsible subscriber and contact details

DEPARTMENT OF JUSTICE 08 9264 1440 Name Contact fax Contact phone 08 9264 1176

Customer code EFA18790

Contact name Gayle Elizabeth Ferguson Contact email

Contact address DAVID MALCOLM JUSTICE CENTRE Client reference 4599-19 MC1

28 BARRACK STREET PERTH WA

6000

Lodgement fees

Gst Fee description Net Fees **ELNO - Caveat** \$174.70 \$0.00 \$174.70

\$174.70 Total

Operative clause

The caveator claims the Estate or Interest specified in the Land on the Grounds set out herein and forbids the registration of any Instrument affecting the Estate and Interest to the Extent of Prohibition as specified.

Land

Title(volume-folio) Extent Land description Estate and/or interest

2959-379 1/2 UNDIVIDED SHARE OF THOSE PARTS OF **FEE SIMPLE** Part

LOT 9 ON DEPOSITED PLAN 415221 AS ARE: (A) DELINEATED AND MARKED 'YRE' AND 'YANCHEP RAIL EXTENSION ON THE PLAN

MARKED C1 ANNEXED HERETO; (B) **DELINEATED AND MARKED 'YANCHEP** STATION BUS INTERCHANGE' ON THE PLAN MARKED C2 ANNEXED HERETO; AND (C) DELINEATED AND MARKED 'CAVEAT AREA' ON THE PLAN MARKED C3 ANNEXED HERETO

2950-642 Part 1/2 UNDIVIDED SHARE OF THAT PART OF LOT FEE SIMPLE

9101 ON DEPOSITED PLAN 406263 AS IS DELINEATED AND MARKED 'YANCHEP RAIL EXTENSION' ON THE PLAN MARKED C4

ANNEXED HERETO

0438414 Page 1 of 2 **CAV001** 

#### Caveator/s

WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC)

#### Estate and interest being claimed

Equitable Interest as Purchaser of the Fee Simple

#### Grounds of claim

Claim statement Purchaser's contract with the following Parties and Date

Parties NEW ORION INVESTMENTS PTY LTD (ACN 116528431)

WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC)

Date 29/06/2020

#### Extent of prohibition

Absolute

#### Service of notice to the caveator/s

Address DAVID MALCOLM JUSTICE CENTRE 28 BARRACK STREET PERTH WA 6000

#### Registered proprietor/s

0438414

NEW ORION INVESTMENTS PTY LTD (ACN 116528431) OF LEVEL 4 225 ST GEORGES TERRACE PERTH

#### Subscriber Certification and Execution on behalf of Caveator/s

DEPARTMENT OF JUSTICE (ABN 70598519443) makes the following certifications:

- The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
- 2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
- The Certifier has taken reasonable steps to verify the identity of the caveator or his, her or its administrator or attorney.

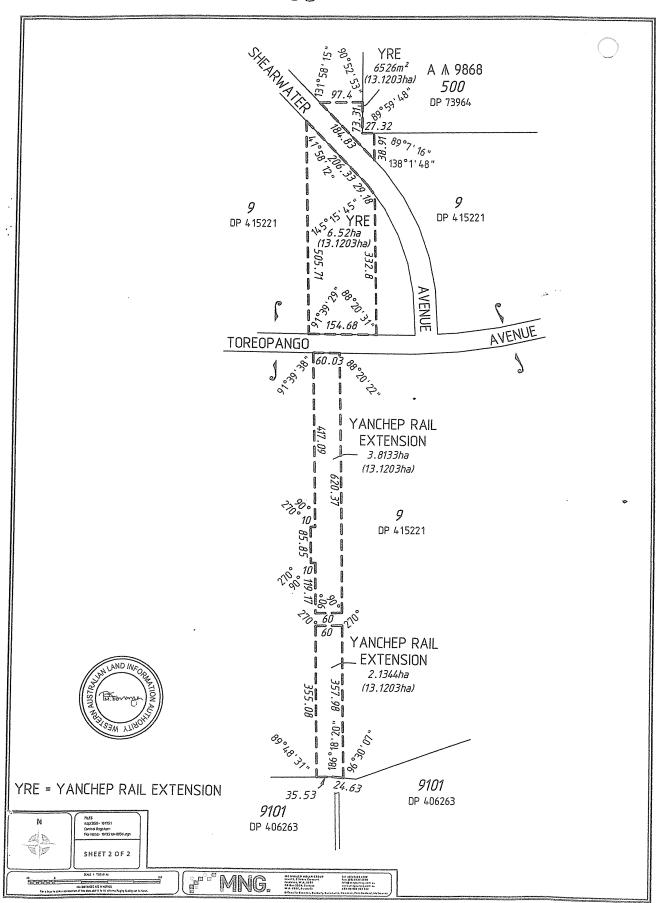
Digitally signed by GAYLE ELIZABETH FERGUSON for DEPARTMENT OF JUSTICE (ABN 70598519443) on behalf of WESTERN AUSTRALIAN PLANNING COMMISSION (GPR SSPC) on 30 June 2020

Page 2 of 2

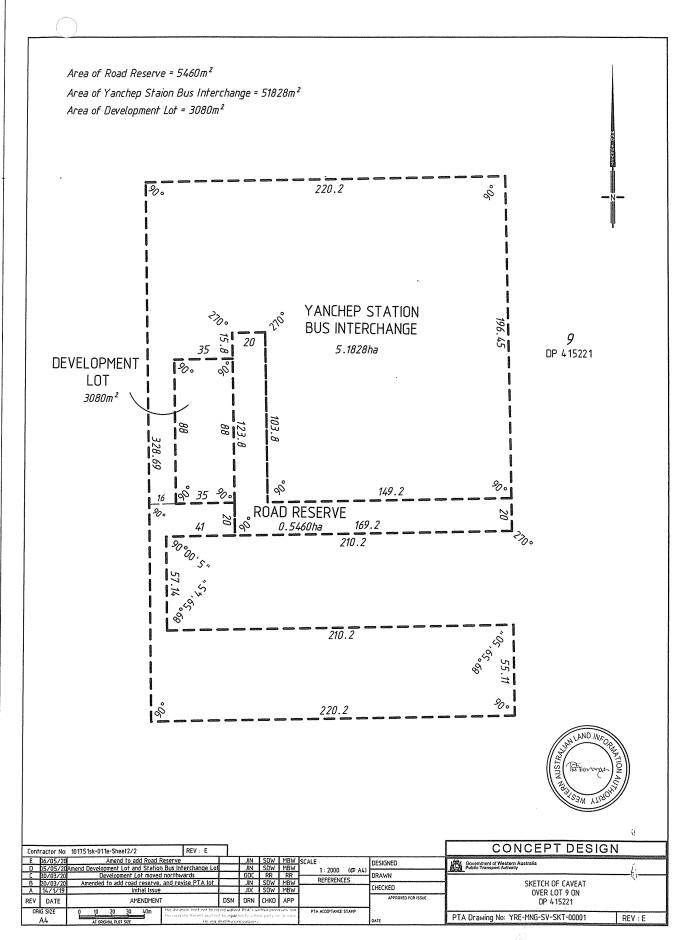
**CAV001** 

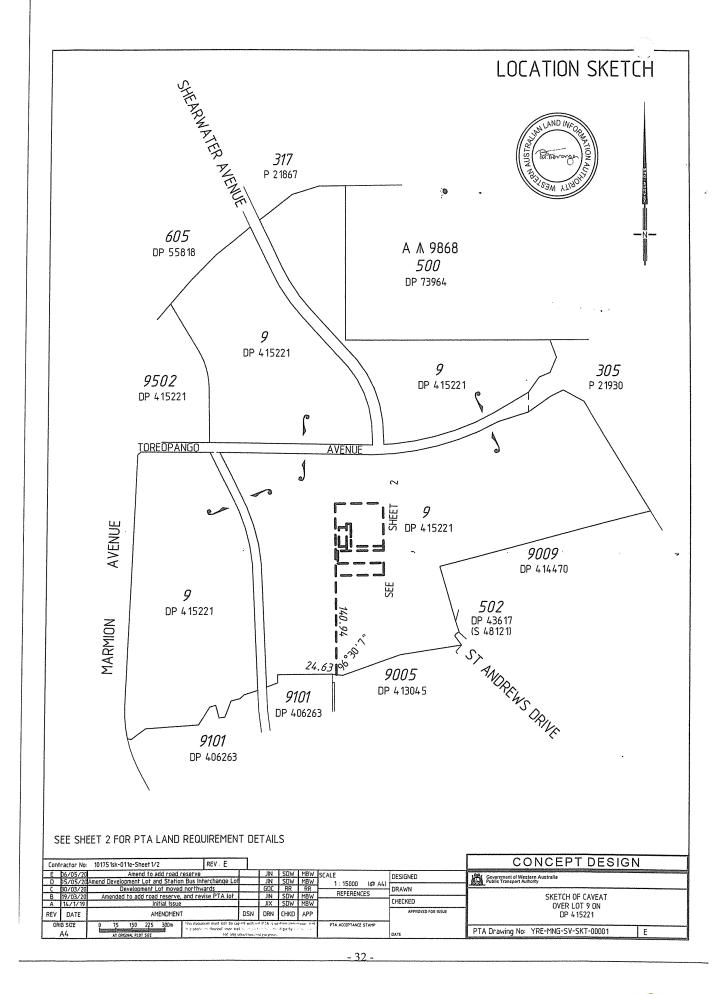
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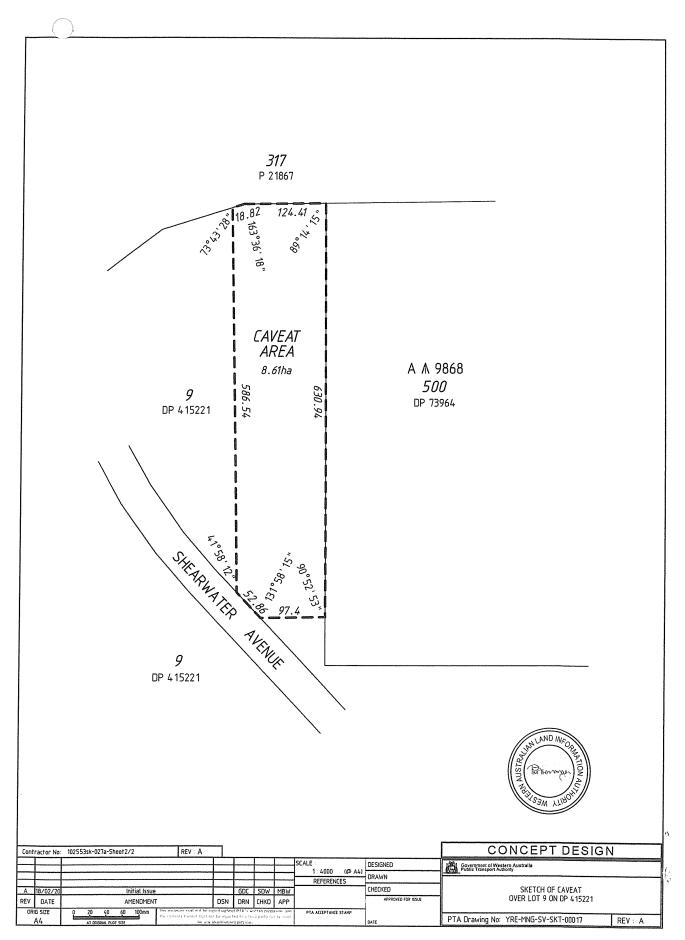
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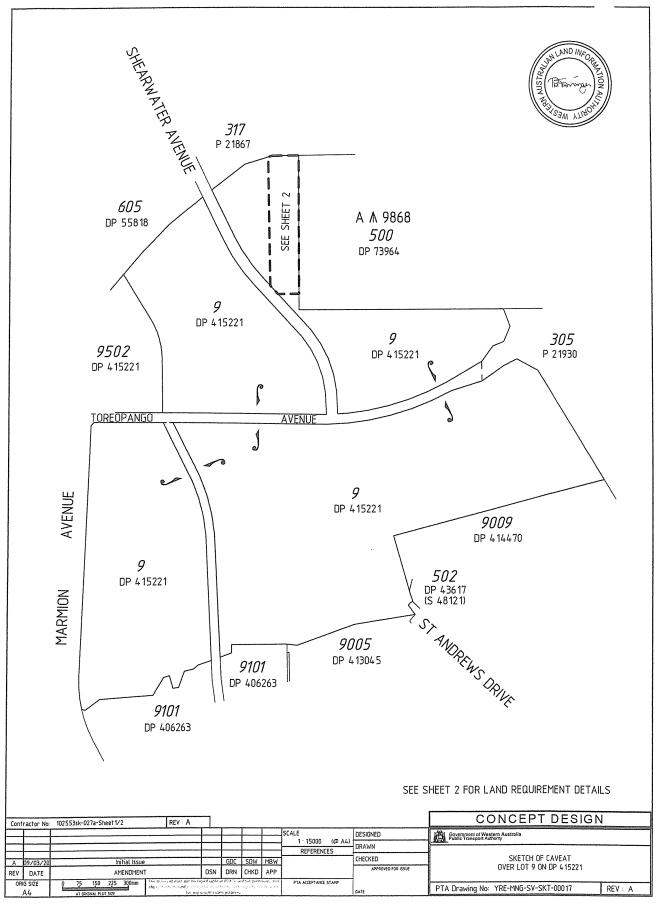


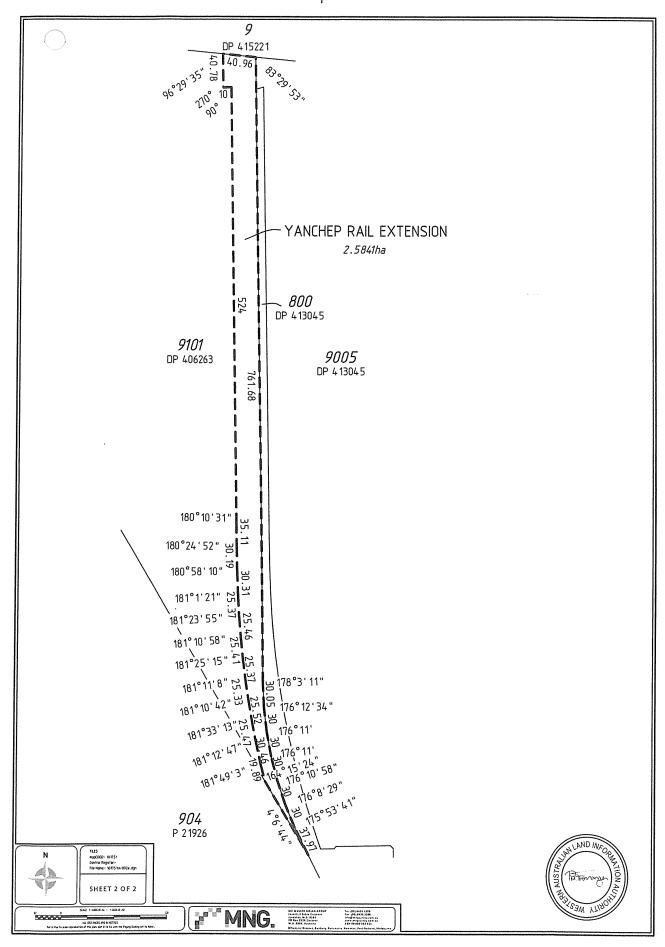
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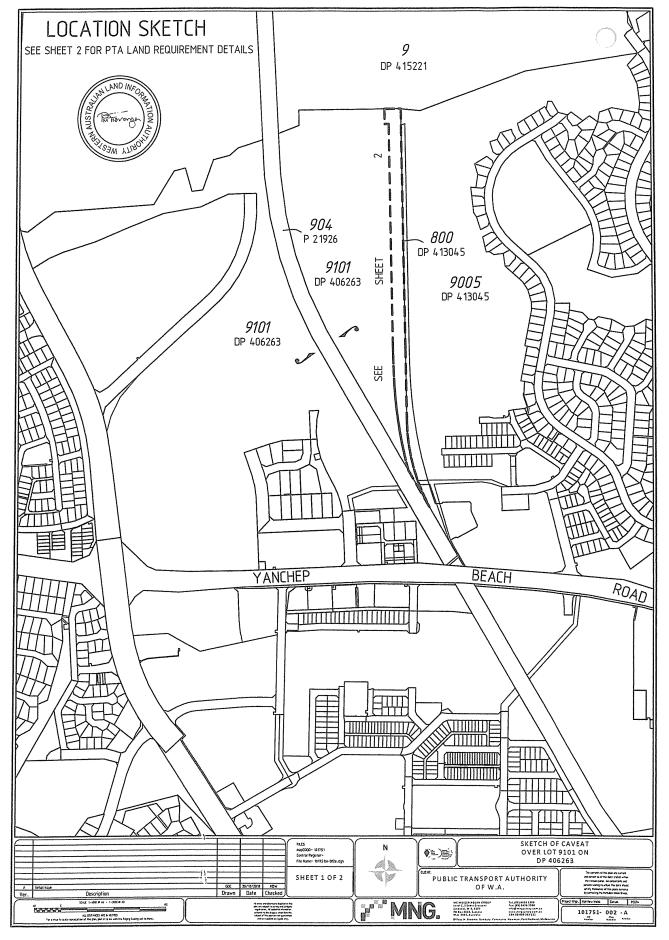
















NEW ORION INVESTMENTS PTY LTD CARE OF MOORE STEPHENS LEVEL 3, 12-14 ST GEORGES TERRACE PERTH, WA 6000

Dear Sir/Madam

I advise that a caveat has been lodged against the Certificate of Title for your land. Your land ownership details are described in the schedule overleaf.

Some details of the Caveat including a copy of part of the "Estate or interest claimed" section are shown in the schedule overleaf.

A caveat is a statutory notice lodged against the Certificate of Title for the land evidencing a claim to an interest in that land. The claim is made by a person who is not the registered owner of the land. The person claiming the interest in the land is known as the caveator.

The existence of a caveat on the title does not allow the caveator to deal with the land, however the caveat may prevent the registration of any change to the title for the land until notice of that change has been given to the caveator.

The caveat will remain on the title until it is withdrawn by the caveator or action is taken for its removal.

A complete copy of the caveat may be obtained (on payment of the prescribed fee) at www.landgate.wa.gov.au. If you wish to seek further information regarding the caveat, Landgate may be contacted on +61 (0)8 9273 7373 or by email to customerservice@landgate.wa.gov.au. Please be aware that legal advice cannot be provided. Customers requiring any legal advice must seek their own independent legal advice.

Finally, please note that, due to the numbers of caveats lodged daily at the Western Australian Land Information Authority (Landgate), the Registrar of Titles is personally not able to assist you with caveat enquiries.

Sincerely,

JEAN VILLANI REGISTRAR OF TITLES







Caveat No:	O438414
Caveator:	WESTERN AUSTRALIAN PLANNING COMMISSION
Nature of Claim:	ABSOLUTE
Affected Titles:	2950-642,2959-379
Affected Documents:	
Estate/Interest Claimed:	CLAIM CATEGORY: AGREEMENT/CONTRACT CLAIM STATEMENT: EQUITABLE INTEREST AS PURCHASER OF THE FEE SIMPLE







NEW ORION INVESTMENTS PTY LTD LEVEL 4 225 ST GEORGES TCE PERTH. WA 6000

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Sincerely,

JEAN VILLANI

**REGISTRAR OF TITLES** 



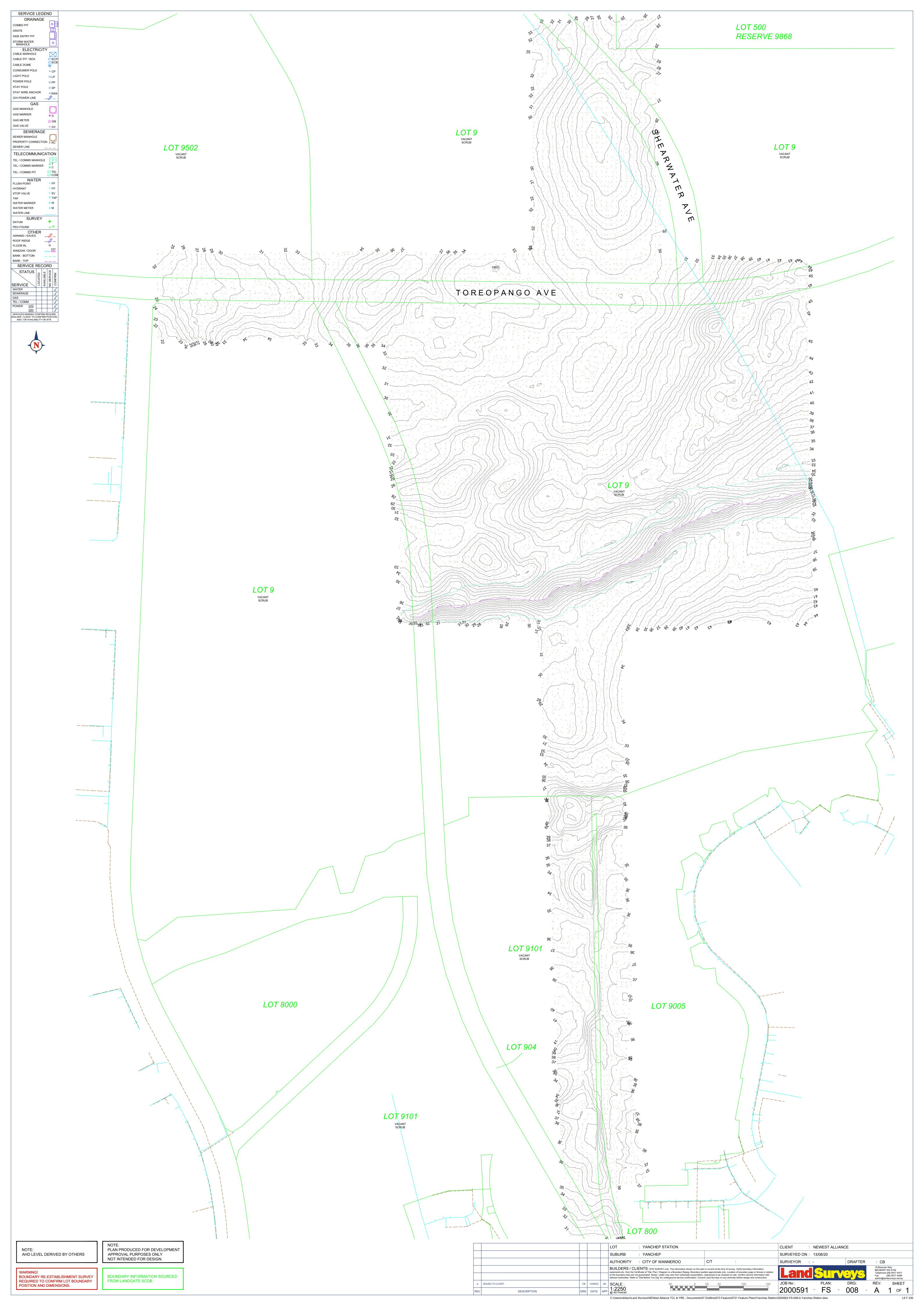


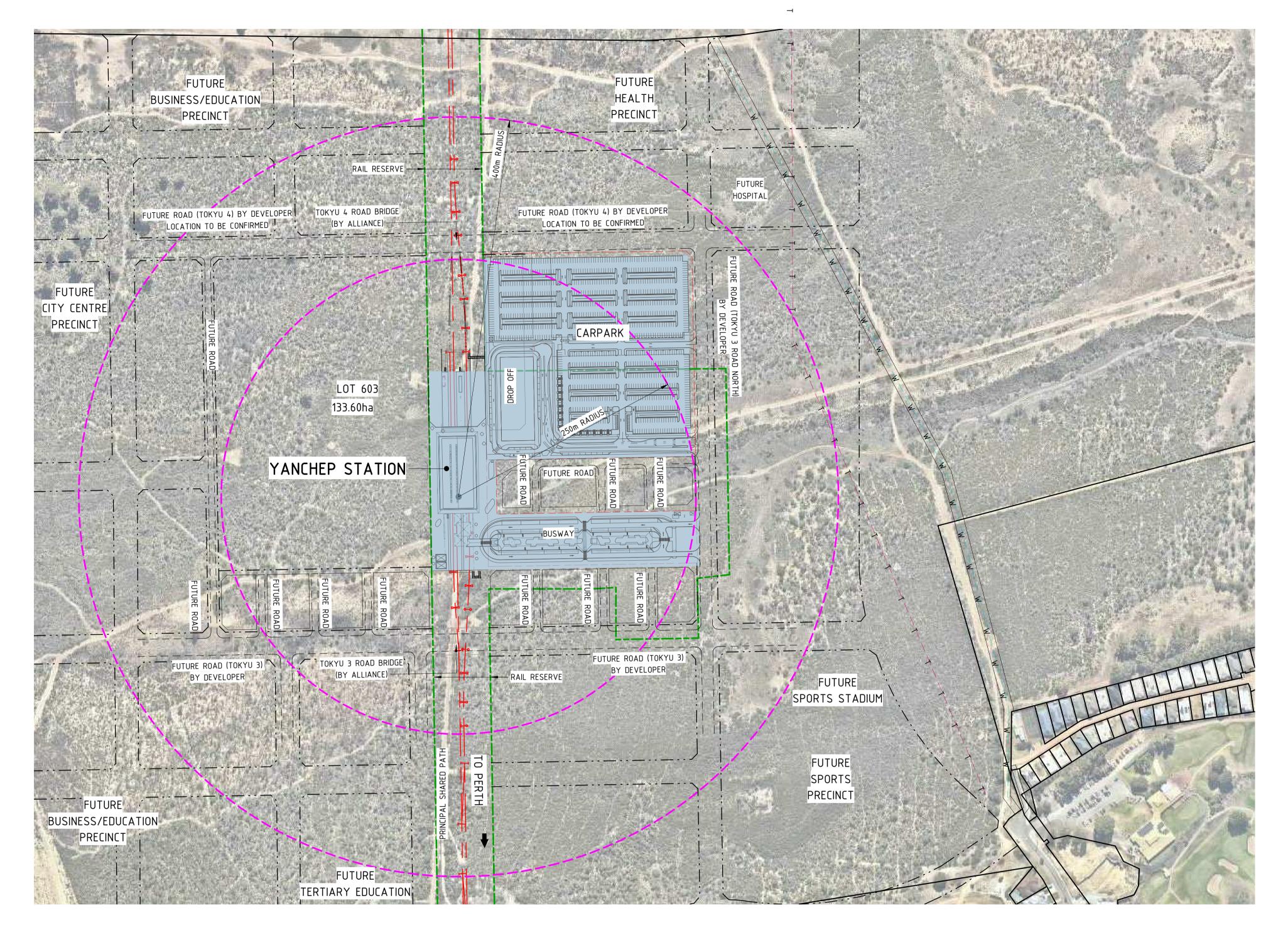


Caveat No:	O438414
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Nature of Claim:	ABSOLUTE
Affected Titles:	2950-642,2959-379
Affected Documents:	
Estate/Interest Claimed:	CLAIM CATEGORY: AGREEMENT/CONTRACT CLAIM STATEMENT: EQUITABLE INTEREST AS PURCHASER OF THE FEE SIMPLE



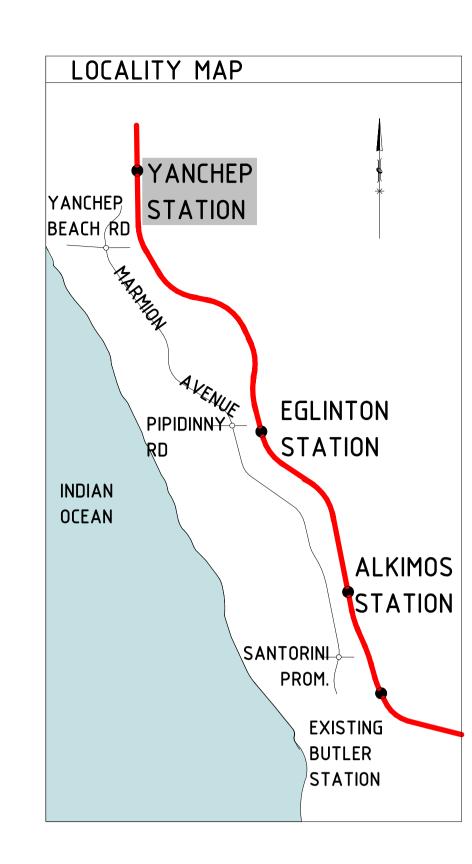
#### **STATION WORKS PLANS** APPENDIX C





SITE ANALYSIS AND CONTEXT PLAN OVERALL LAYOUT
Scale: 1: 2500

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## <u>NOTES</u>

- ALL FUTURE ROADS AND BRIDGES ARE SHOWN FOR INFORMATION PURPOSES ONLY.
- 2. PROPOSED ROAD RESERVE BOUNDARY IS SUBJECT TO CHANGE BASED ON FURTHER DESIGN AND INVESTIGATION.

## <u>LEGEND</u>

EXISTING CADASTRAL BOUNDARIES
PROPOSED RAIL RESERVE BOUNDARY
PROPOSED LOT BOUNDARIES (STATION)
PROPOSED BUTLER TO YANCHEP RAIL
FUTURE ROADS BY OTHERS
FUTURE LOT BOUNDARIES BY OTHERS

FUTURE LOT BOUNDARIES BY



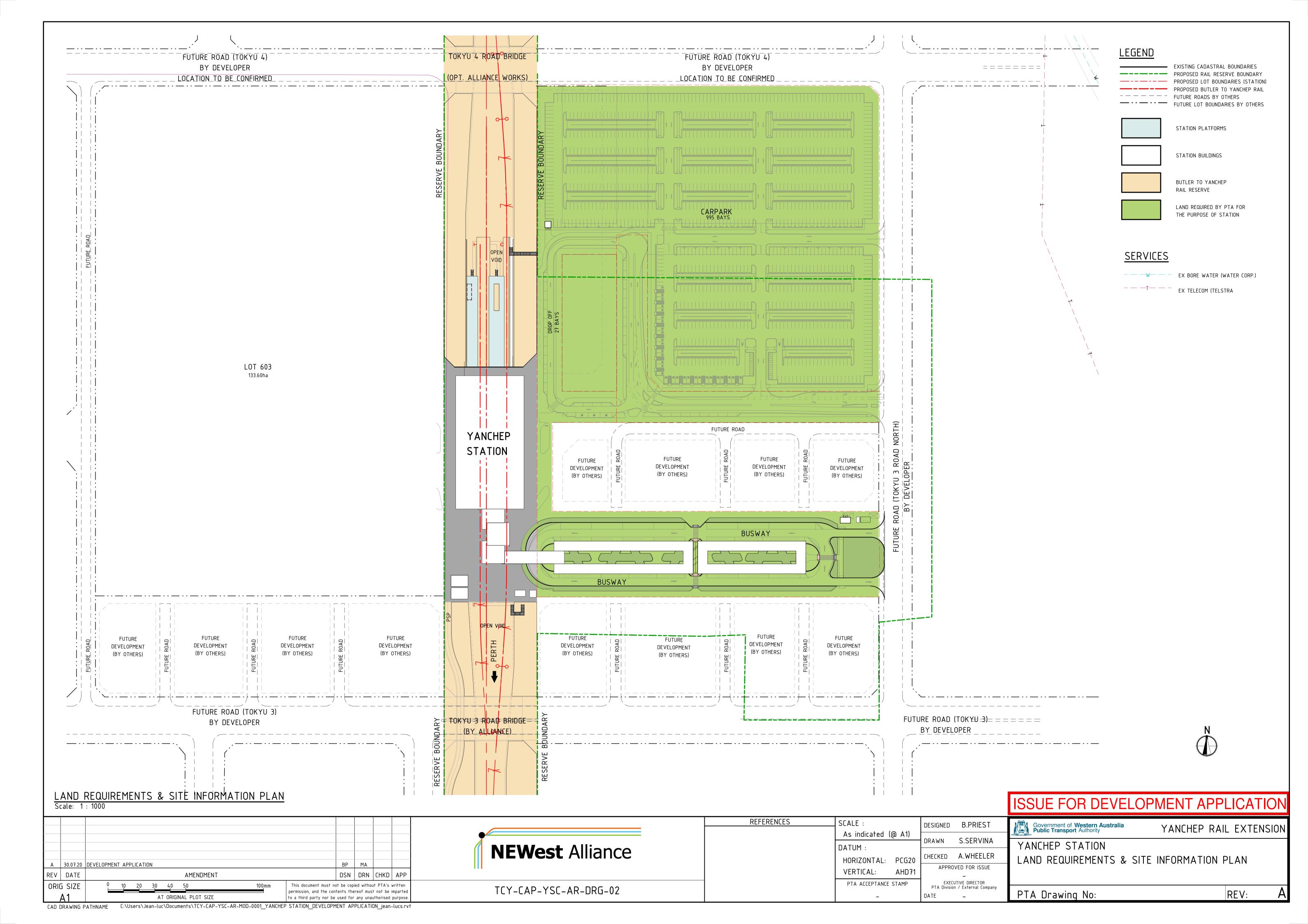
PROPOSED YANCHEP STATION

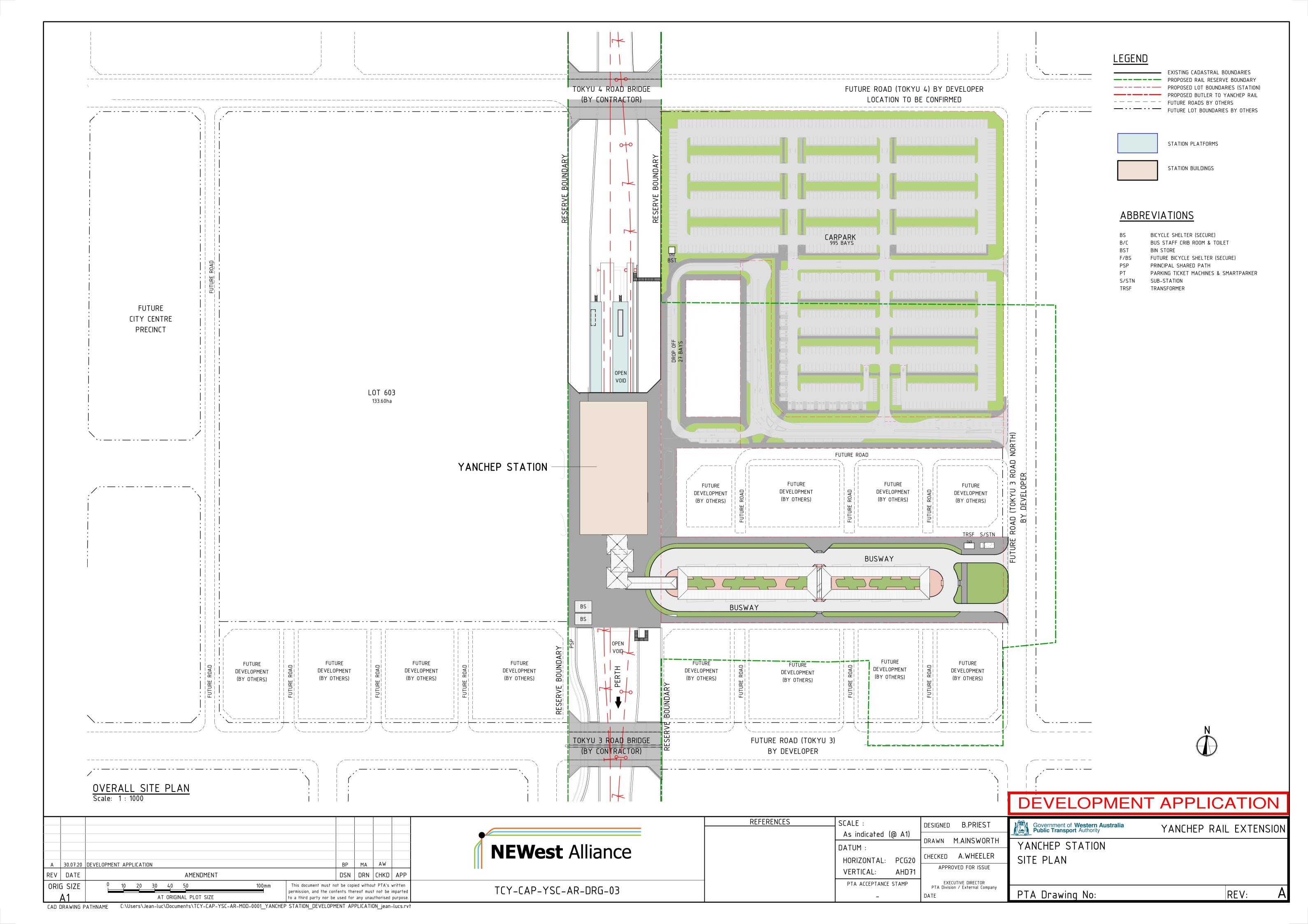
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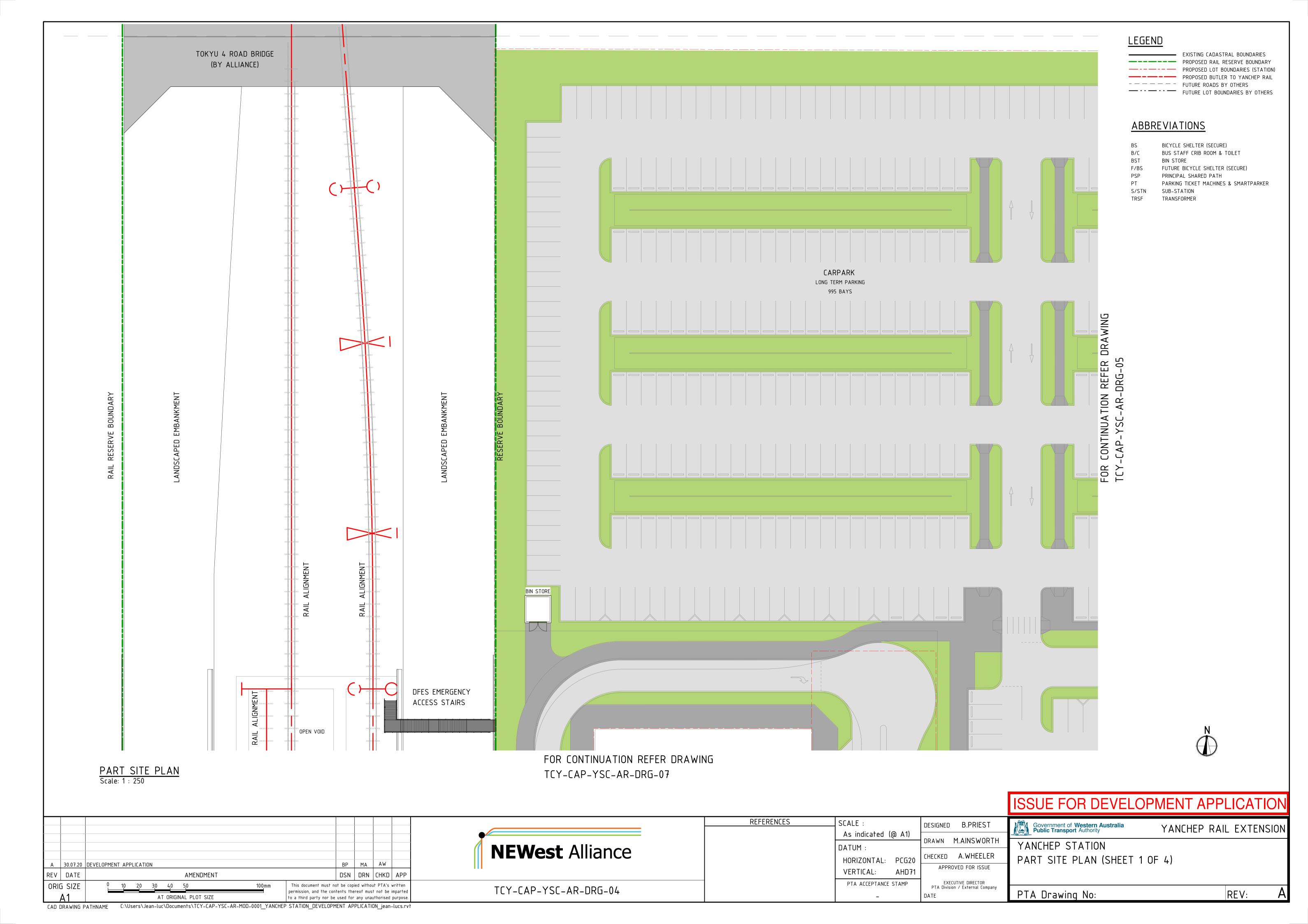
- - - W - - EX BORE WATER (WATER CORP.)
- - - T - - EX TELECOM (TELSTRA

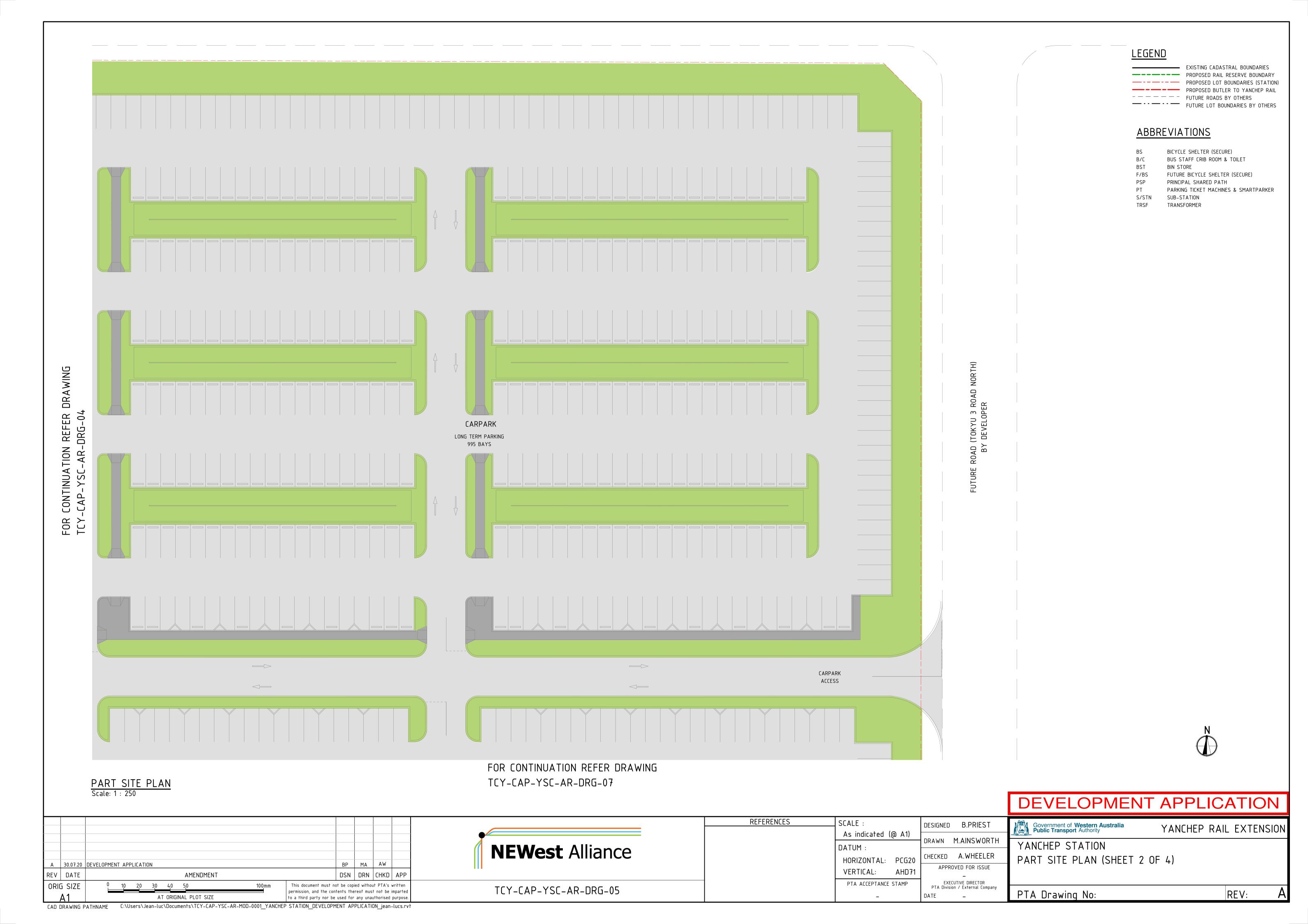


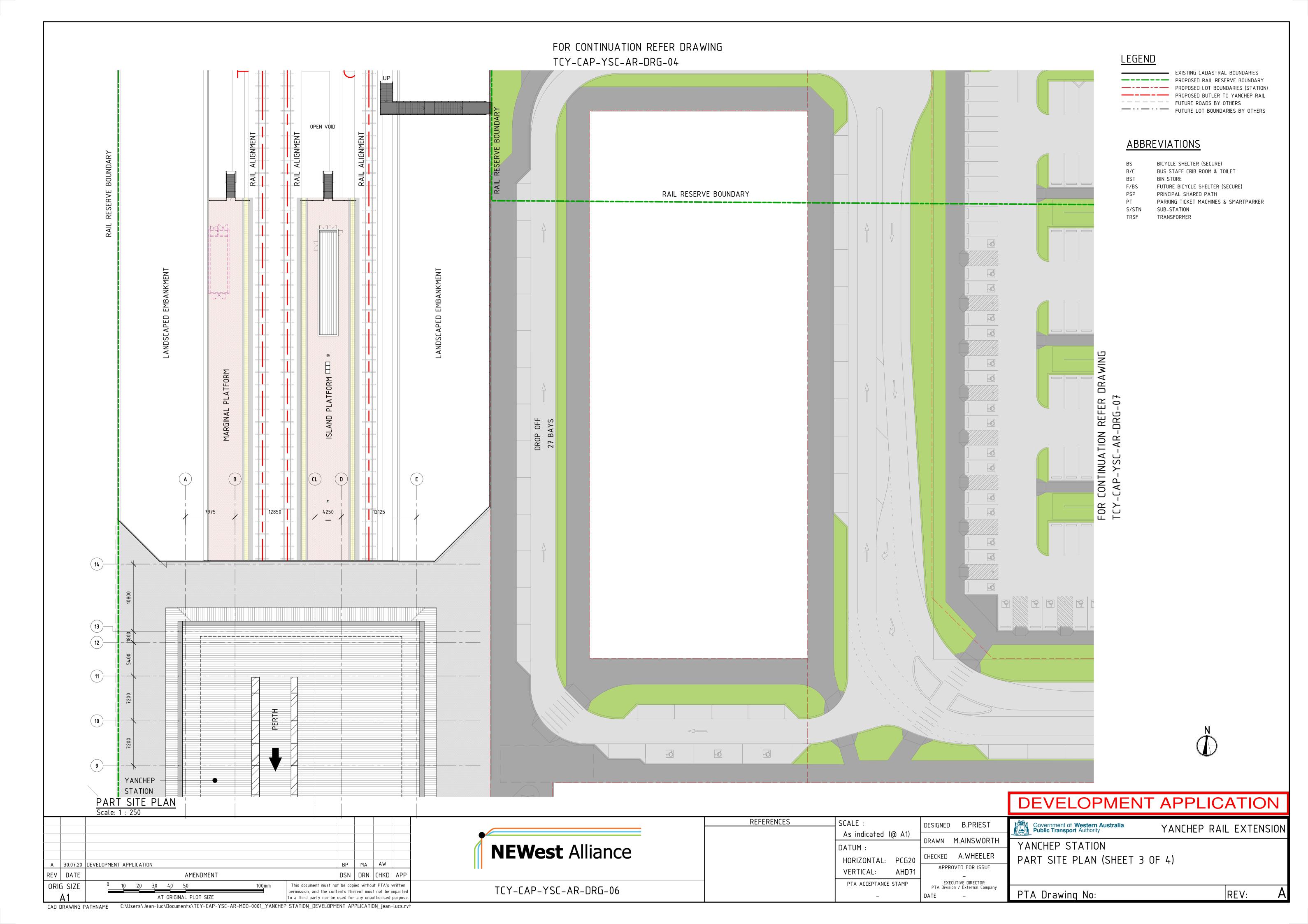
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			REFERENCES SCALE : As indicated (@ A1)		Government of Western Australia  YANCHEP RAIL EXTENSION
		NEWest Alliance	DATUM :	DRAWN M.AINSWORTH	YANCHEP STATION
A 30.07.20 DEVELOPMENT APPLICATION	BP MA AW		HORIZONTAL: PCG20	ADDDOVED END ISSUE	SITE ANALYSIS AND CONTEXT PLAN OVERALL LAYOUT
REV DATE AMENDMENT	DSN DRN CHKD APP		VERTICAL: AHD71  PTA ACCEPTANCE STAMP		
permission, and the	not be copied without PTA's written contents thereof must not be imparted be used for any unauthorised purpose.	TCY-CAP-YSC-AR-DRG-01	-	EXECUTIVE DIRECTOR PTA Division / External Company  DATE _	PTA Drawing No: REV: A

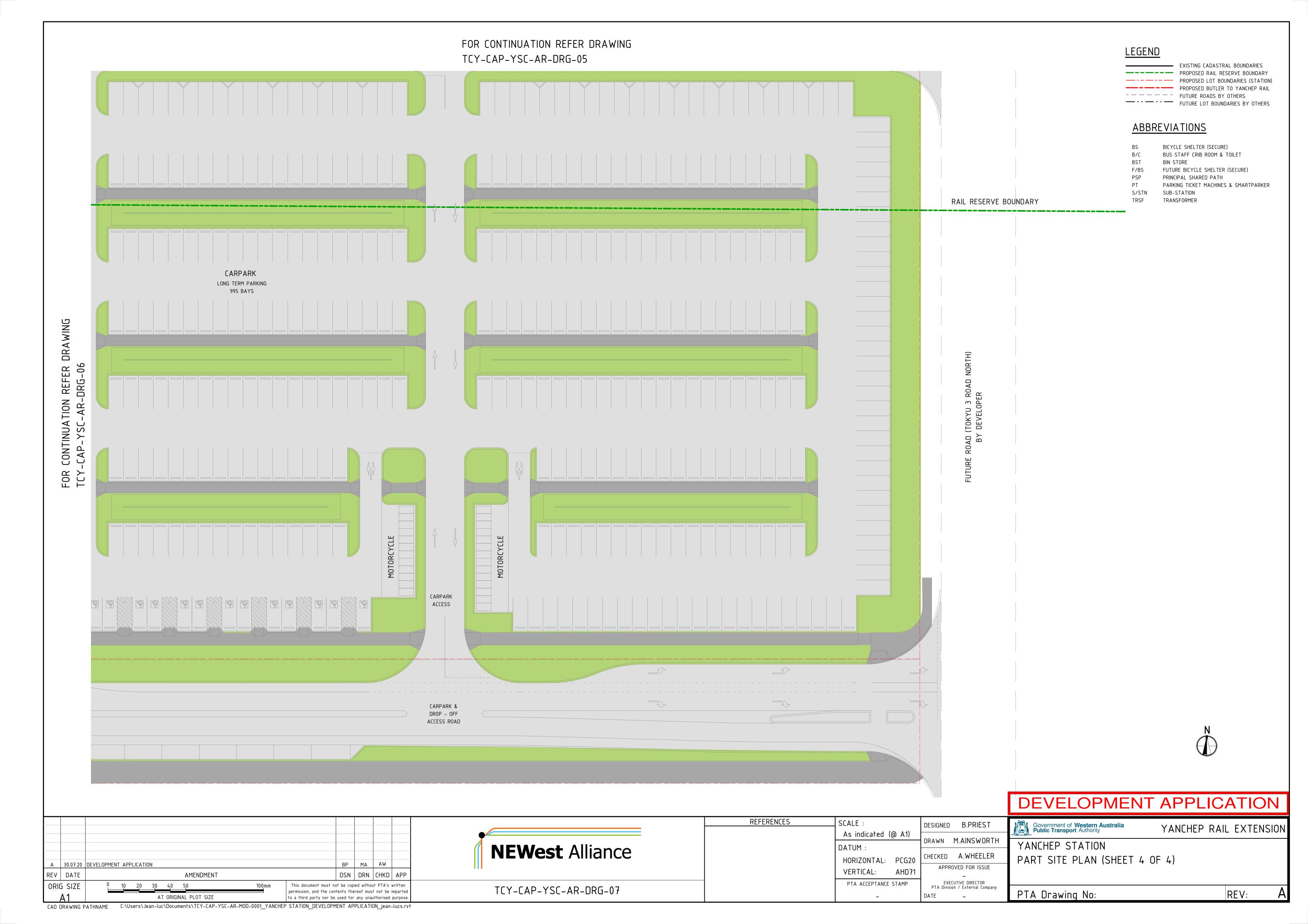


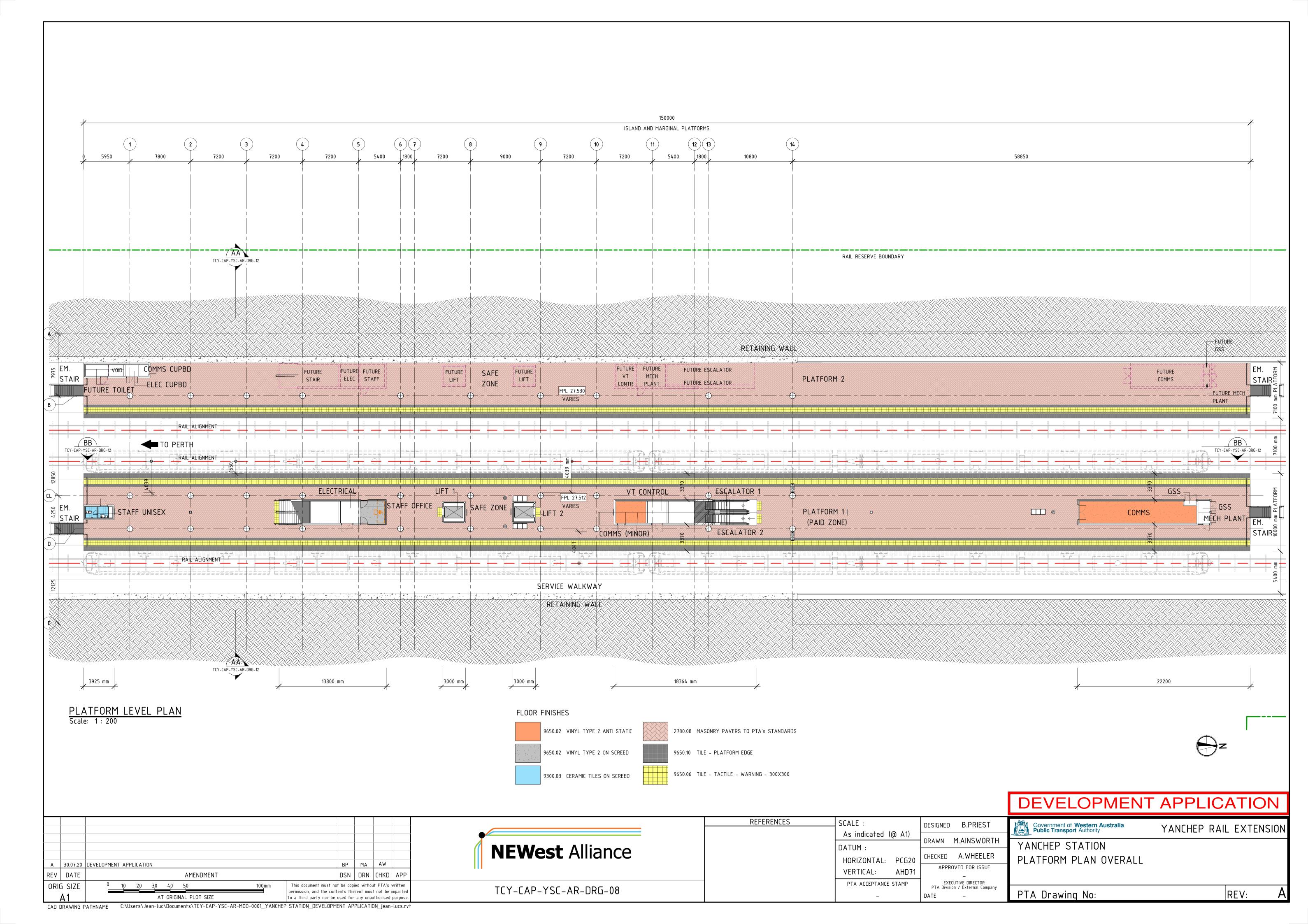


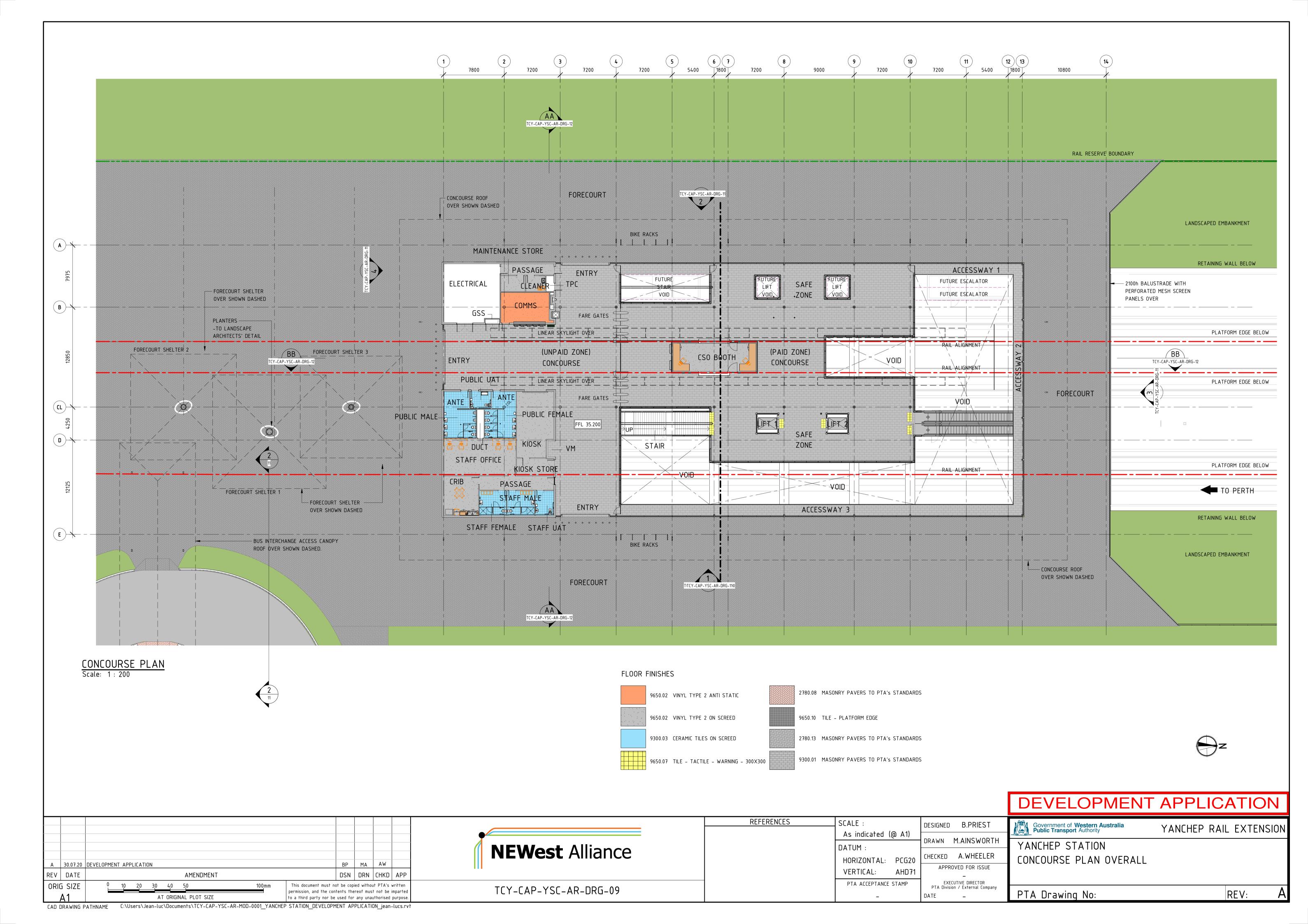


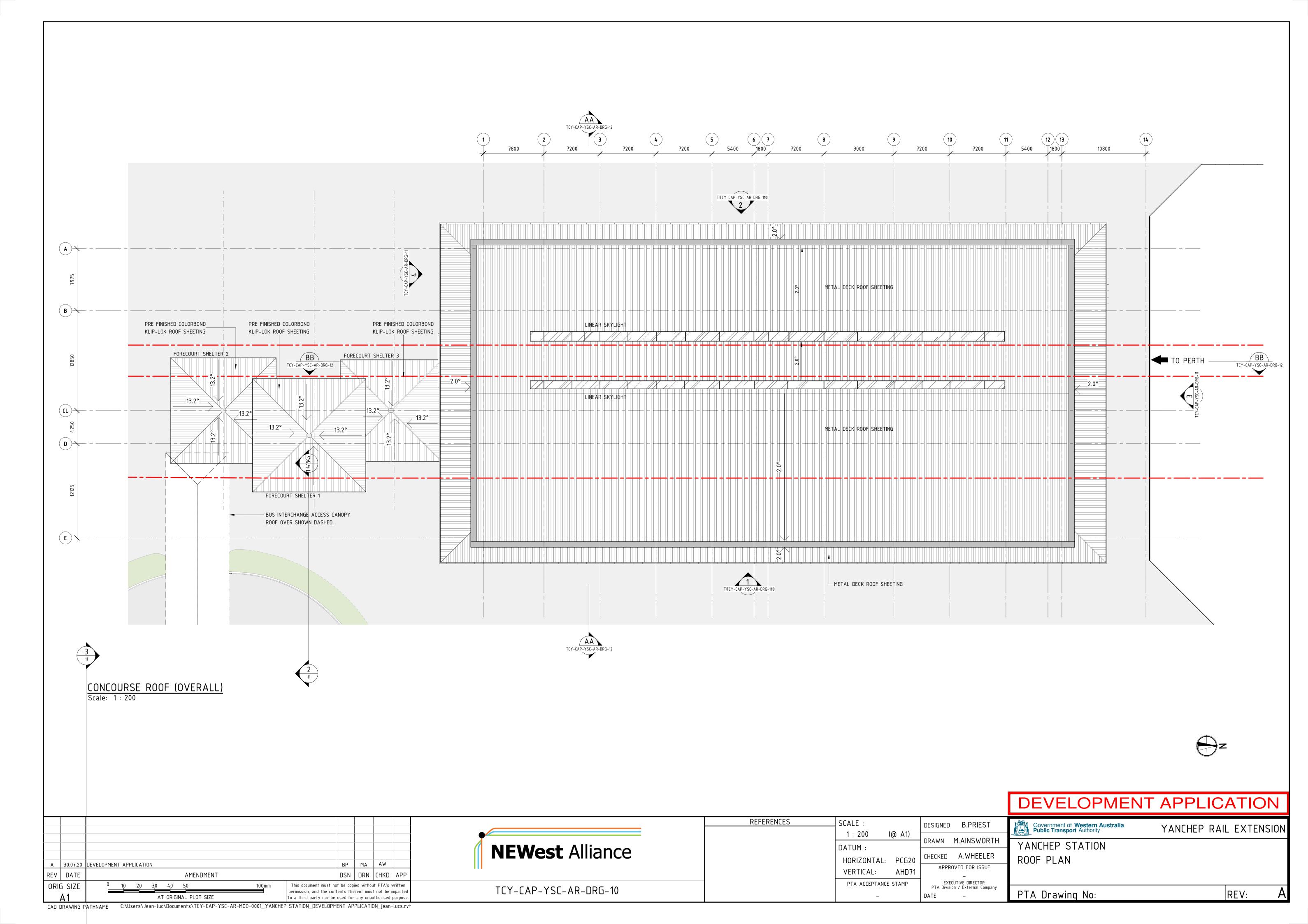


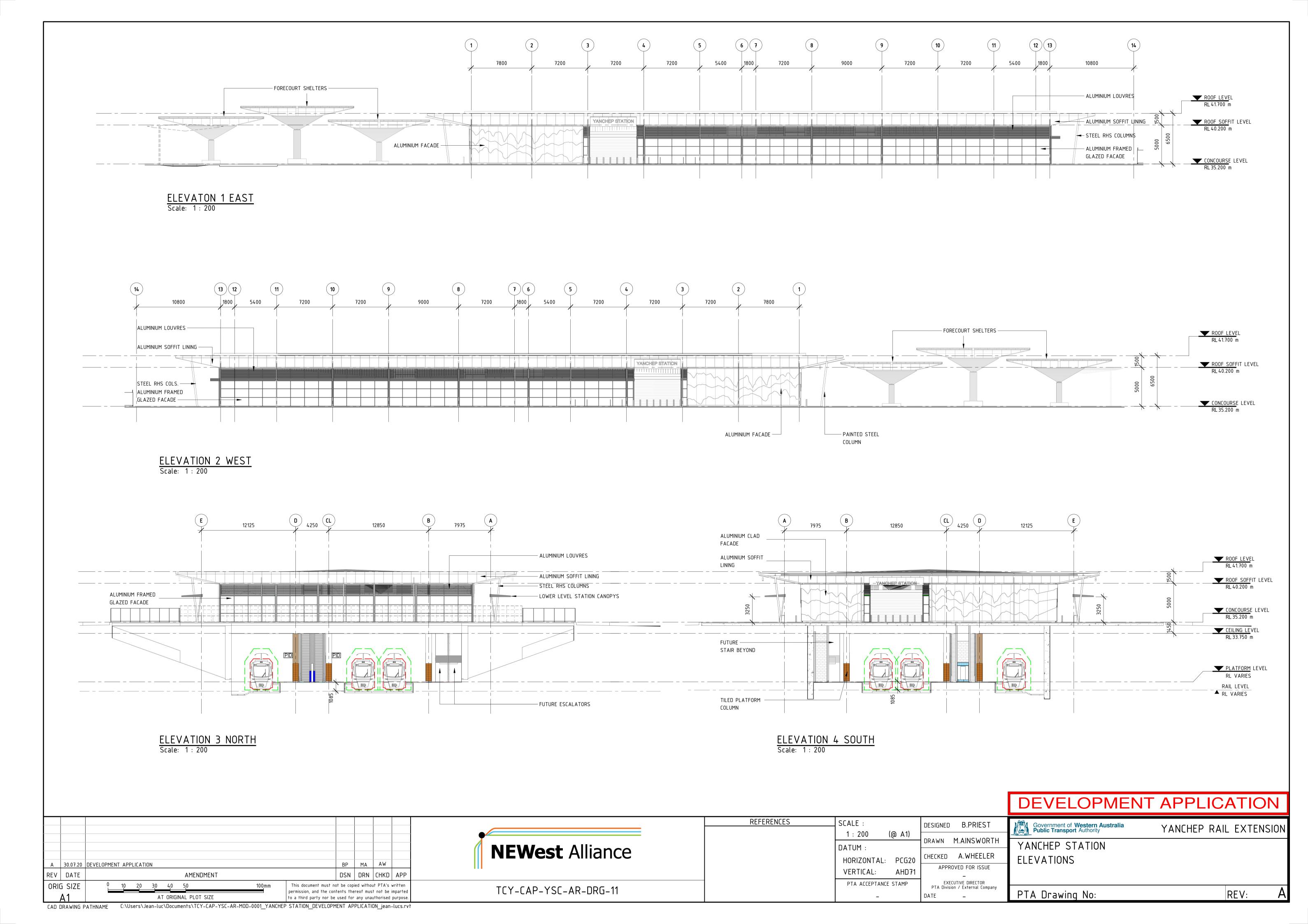


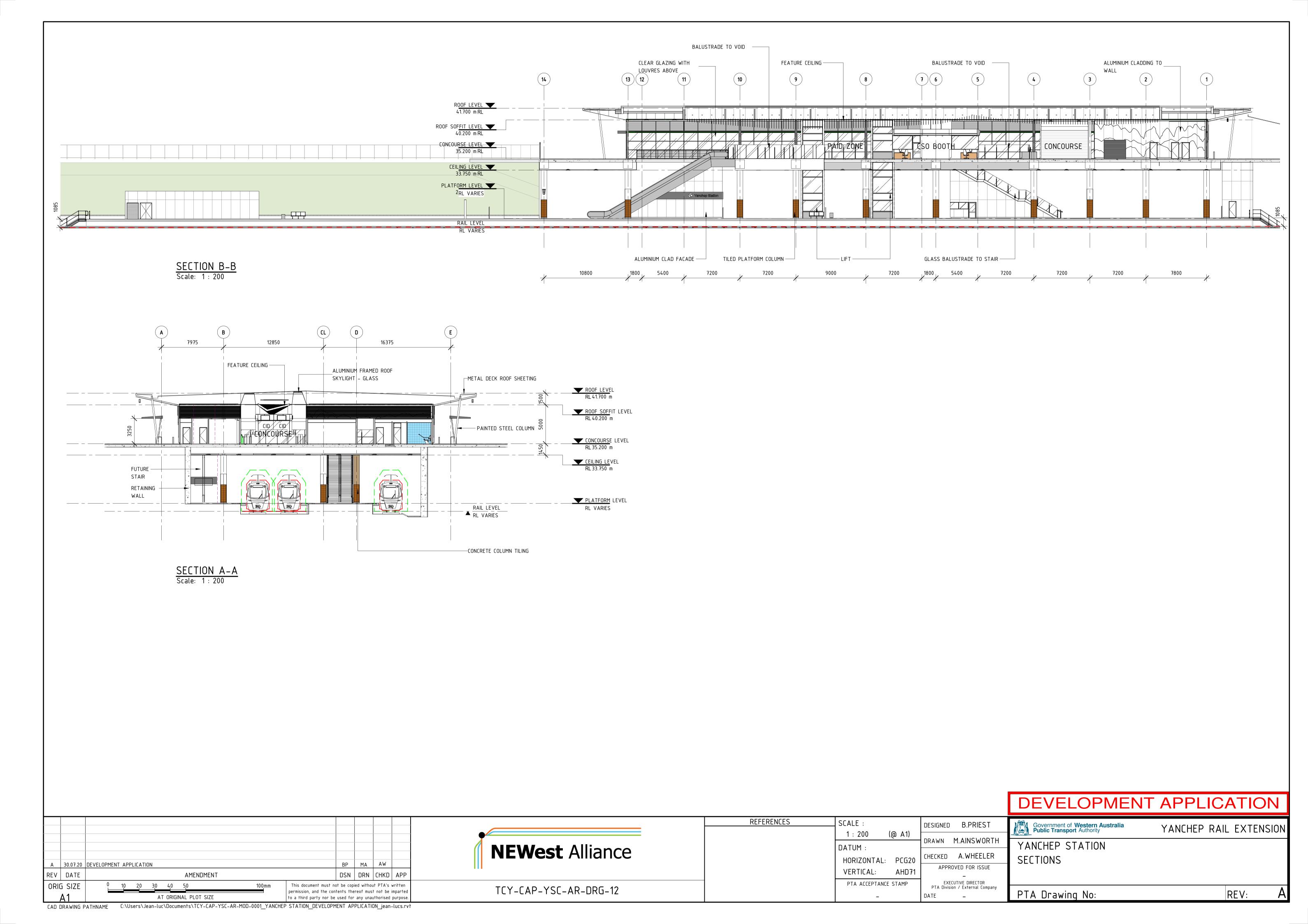














EXTERNAL PERSPECTIVE 1 - AERIAL VIEW LOOKING SOUTH - EAST



EXTERNAL PERSPECTIVE 2 - AERIAL VIEW LOOKING SOUTH - WEST



EXTERNAL PERSPECTIVE 3 - SOUTHERN ENTRY

#### DEVELOPMENT APPLICATION REFERENCES SCALE : DESIGNED B.PRIEST Government of Western Australia Public Transport Authority YANCHEP RAIL EXTENSION (@ A1) DRAWN M.AINSWORTH YANCHEP STATION **NEWest** Alliance DATUM : CHECKED A.WHEELER INDICATIVE IMAGES HORIZONTAL: PCG20 A 30.07.20 DEVELOPMENT APPLICATION BP MA AW APPROVED FOR ISSUE VERTICAL: DSN DRN CHKD APP REV DATE AMENDMENT EXECUTIVE DIRECTOR PTA Division / External Company 10 20 30 40 50 PTA ACCEPTANCE STAMP ORIG SIZE This document must not be copied without PTA's written TCY-CAP-YSC-AR-DRG-13 permission, and the contents thereof must not be imparted REV: PTA Drawing No: AT ORIGINAL PLOT SIZE

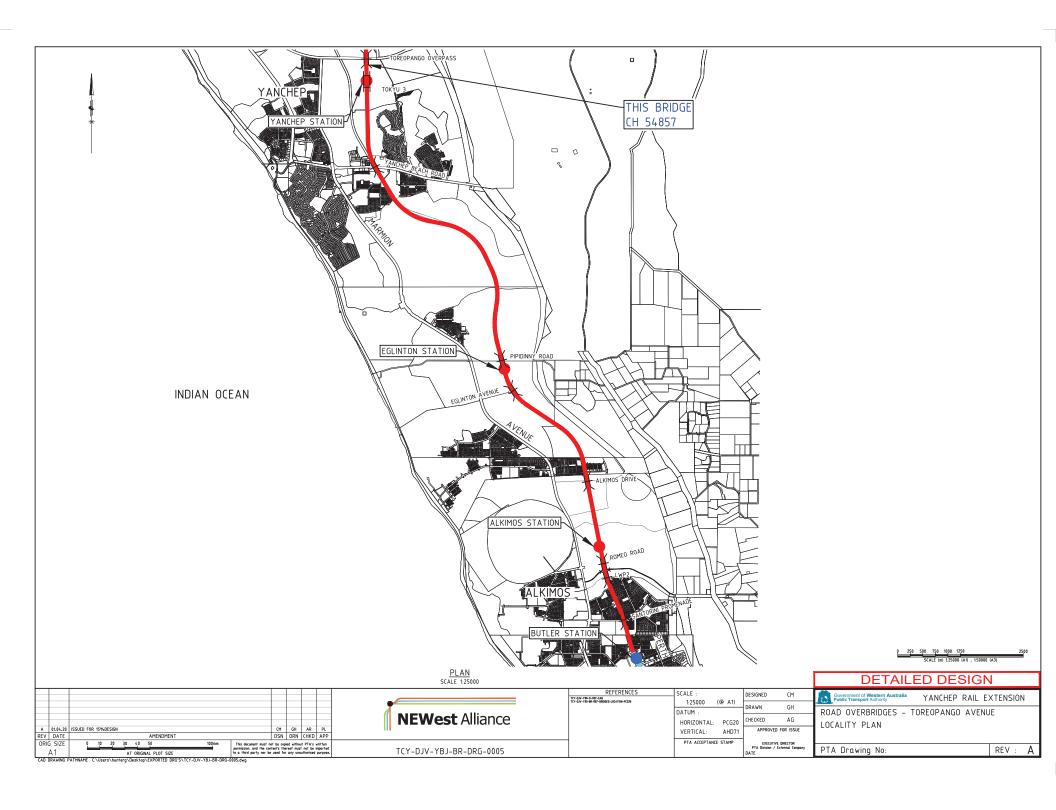
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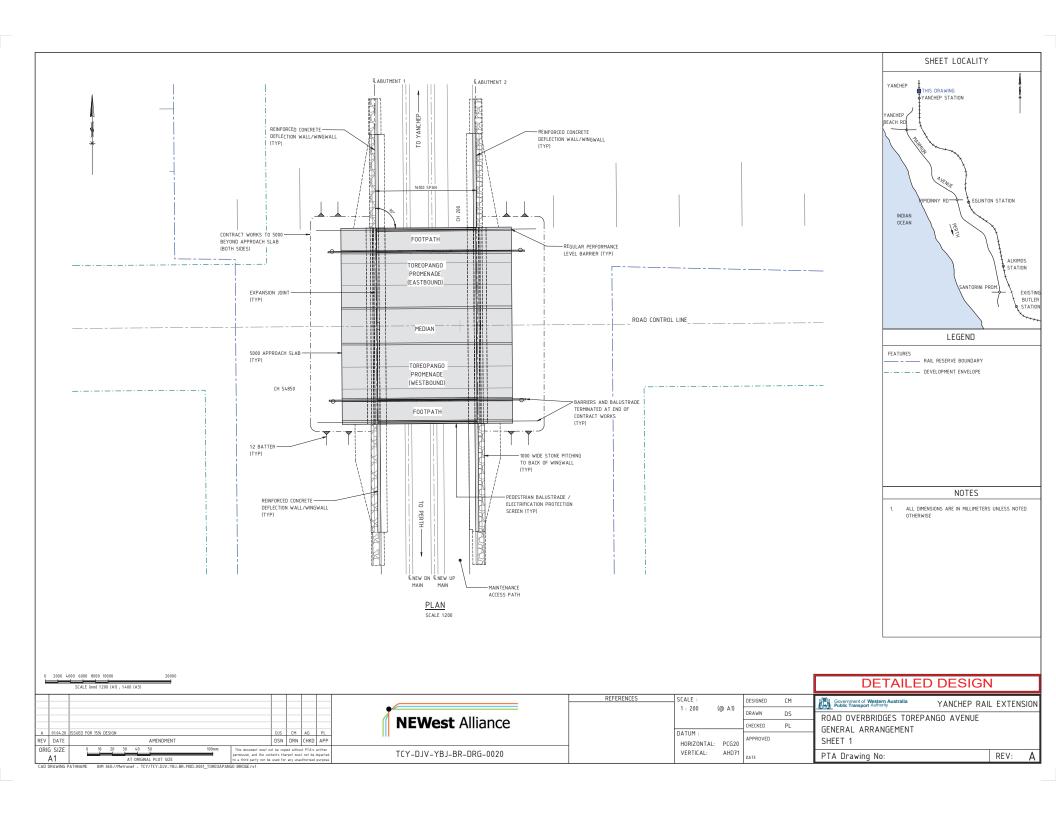
#### **ROAD BRIDGE DESIGNS APPENDIX D**

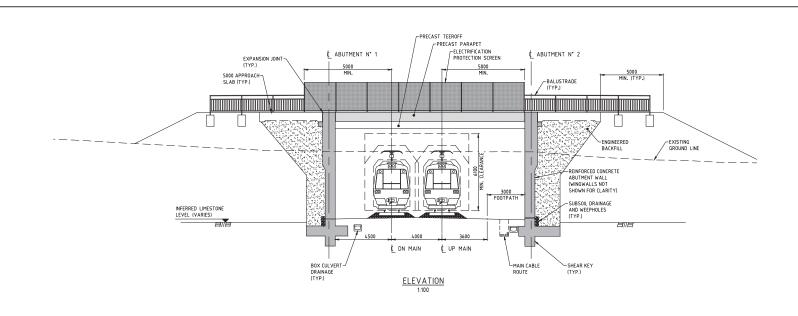
### NEWest ALLIANCE YANCHEP RAIL EXTENSION PACKAGE 05 - ROAD OVERBRIDGES TOREOPANGO AVENUE (CH 54857)

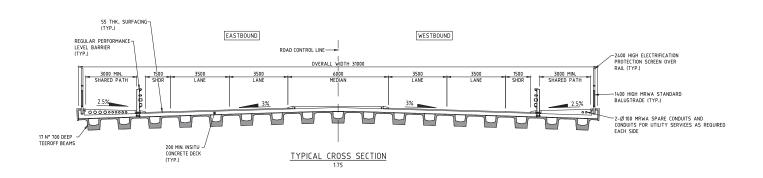
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A	TCY-DJV-YBJ-BR-DRG-0005		LOCALITY PLAN				
A	TCY-DJV-YBJ-BR-DRG-0020		GENERAL ARRANGEMENT - SHEET 1				
A	TCY-DJV-YBJ-BR-DRG-0021		GENERAL ARRANGEMENT - SHEET 2				





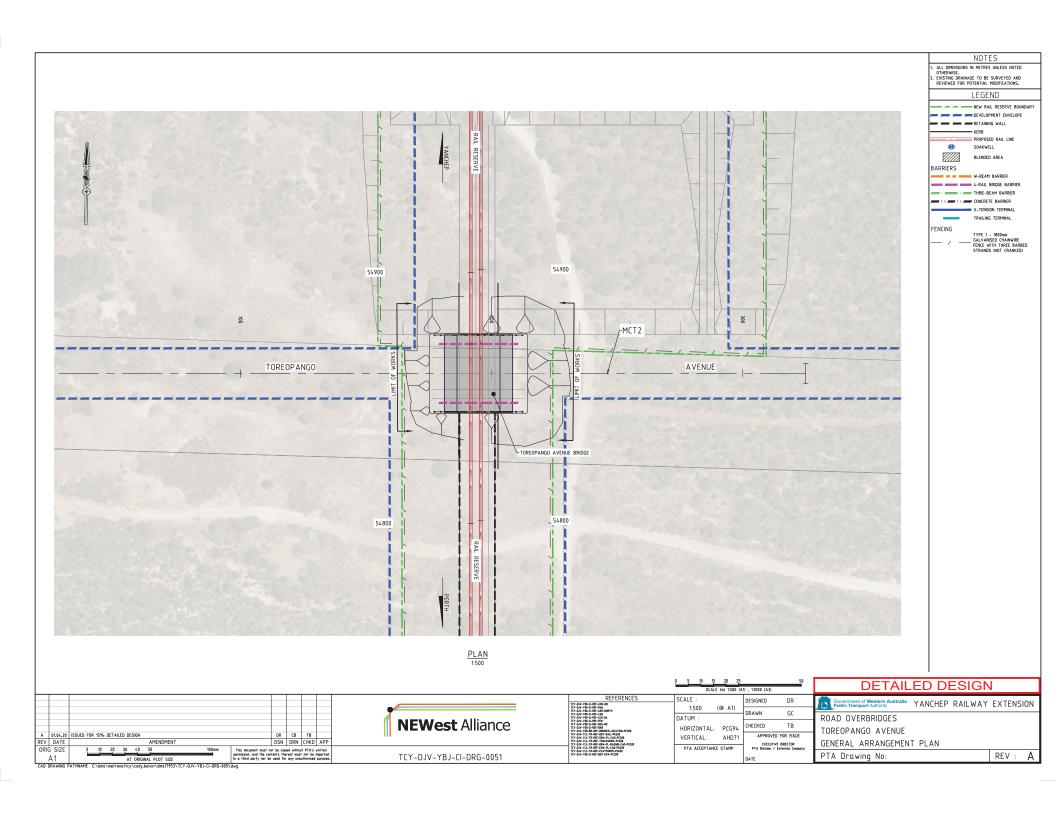


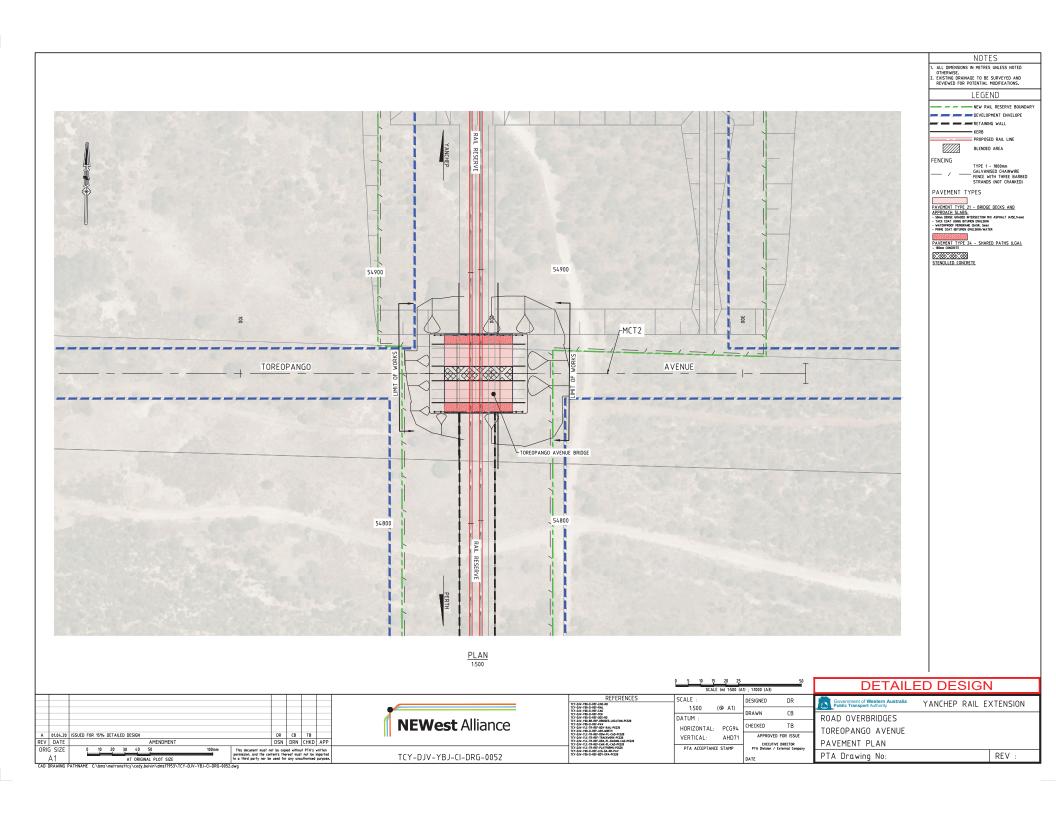


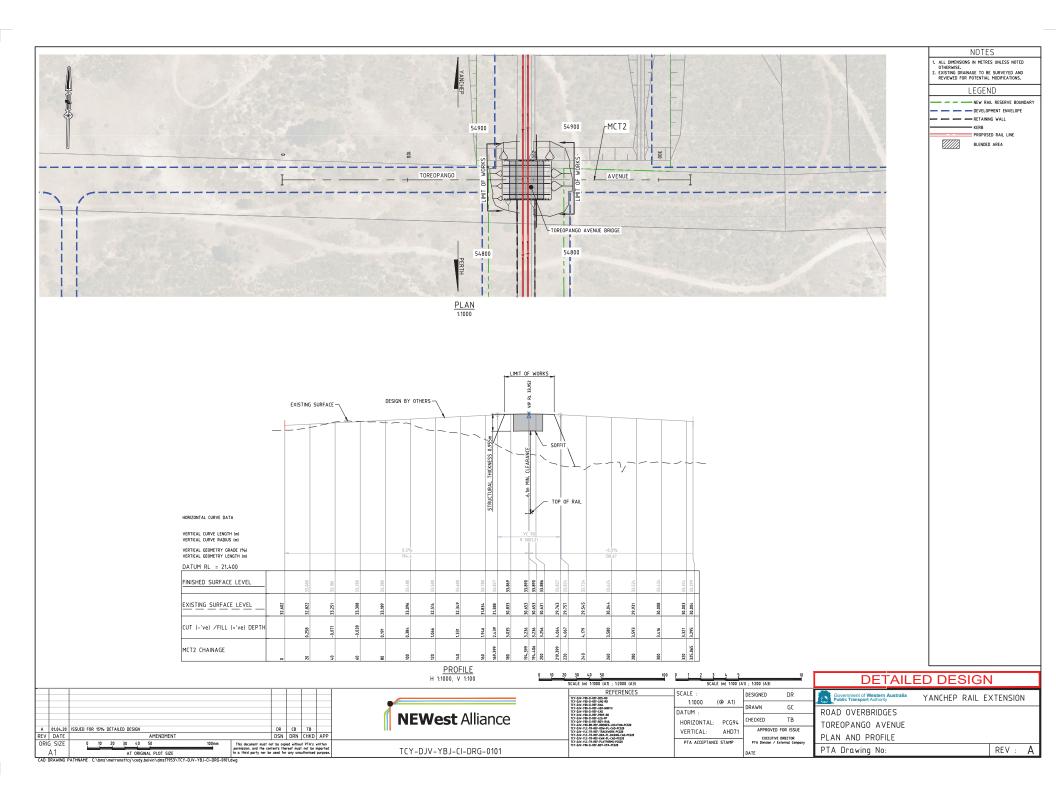




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	_	REFERENCES TCY-DJV-Y00-BR-REF-BRIDGE-PROF	SCALE : 1:100 (@ A1)	DESIGNED CM	Government of Western Australia YANCHEP RAIL EXTENSION
	ALENAK A AU	TCY-DJV-YBJ-BR-REF-BRIDGE-XS	DATUM :	DRAWN GH	ROAD OVERBRIDGES - TOREOPANGO AVENUE
A 01.04.20 ISSUED FOR 15% DESIGN CM GH AR PL	<b>NEWest</b> Alliance		HORIZONTAL: PCG2	CHECKED AR	GENERAL ARRANGEMENT
REV DATE AMENDMENT DSN DRN CHKD APP	***		VERTICAL: AHD7	_	SHEET 2
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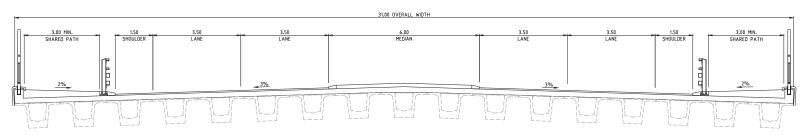






NOTES

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 REFER TO STRUCTURAL DRAWINGS FOR DETAILS.



TYPICAL SECTION
TOREOPANGO AVENUE
SCALE 1:50

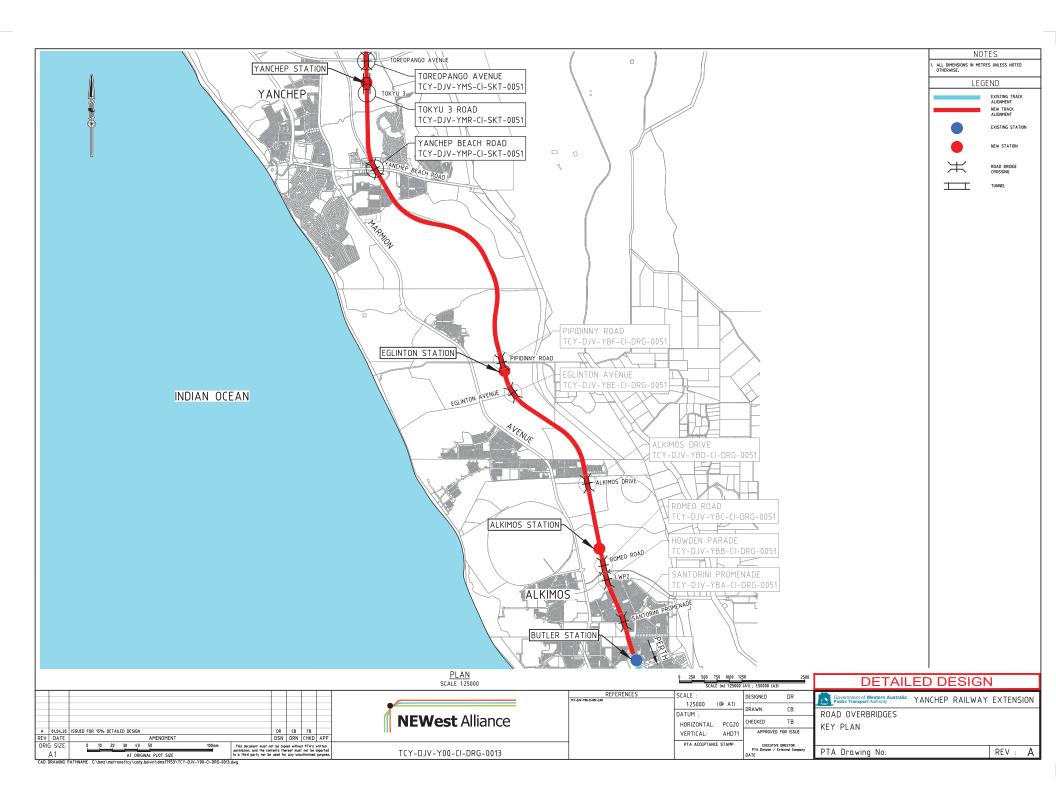


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	DIETAK A A III A A A		DATUM :	DRAWN GC	ROAD OVERBRIDGES
A 01.04.20 ISSUED FOR 15% DETAILED DESIGN DR CB TB	<b>NEWest</b> Alliance		HORIZONTAL: PCG94	CHECKED TB  APPROVED FOR ISSUE	TOREOPANGO AVENUE
REV DATE AMENDMENT DSN DRN CHKD APP			VERTICAL: AHD71  PTA ACCEPTANCE STAMP	EXECUTIVE DIRECTOR	TYPICAL CROSS SECTION
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#### NEWest ALLIANCE YANCHEP RAIL EXTENSION PACKAGE 05 - ROAD OVERBRIDGES ZONE 3

REV No.	DRAWING N	UMBER	DRAWING TITLE						
REV NO.	NEWest	PTA	DRAWING TITLE						
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A	TCY-DJV-Y00-CI-DRG-0013		KEY PLAN						
BRIDGE -	YANCHEP BEACH ROAD	YANCHEP BEACH ROAD							
A	TCY-DJV-YBG-CI-DRG-0051		YANCHEP BEACH ROAD - GENERAL ARRANGEMENT						
A	TCY-DJV-YBG-CI-DRG-0052		YANCHEP BEACH ROAD - PAVEMENT PLAN						
A	TCY-DJV-YBG-CI-DRG-0101		YANCHEP BEACH ROAD - PLAN & PROFILE						
A	TCY-DJV-YBG-CI-DRG-0151		YANCHEP BEACH ROAD - TYPICAL SECTION						
BRIDGE -	TOKYU 3								
A	TCY-DJV-YBI-CI-DRG-0051		TOKYU 3 - GENERAL ARRANGEMENT						
A	TCY-DJV-YBI-CI-DRG-0052		TOKYU 3 - PAVEMENT PLAN						
A	TCY-DJV-YBI-CI-DRG-0101		TOKYU 3 - PLAN & PROFILE						
A	TCY-DJV-YBI-CI-DRG-0151		TOKYU 3 - TYPICAL SECTION						
BRIDGE -	TOREOPANGO AVENUE								
A	TCY-DJV-YBJ-CI-DRG-0051		TOREOPANGO AVENUE - GENERAL ARRANGEMENT						
A	TCY-DJV-YBJ-CI-DRG-0052		TOREOPANGO AVENUE - PAVEMENT PLAN						
A	TCY-DJV-YBJ-CI-DRG-0101		TOREOPANGO AVENUE - PLAN & PROFILE						
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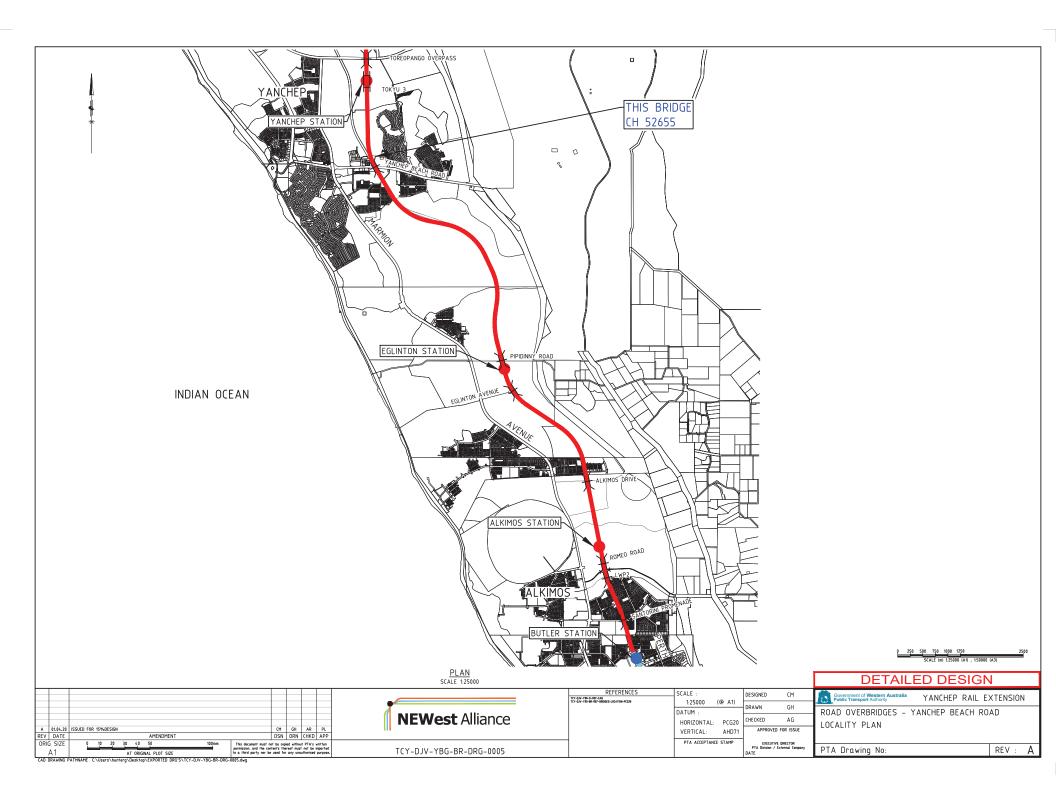


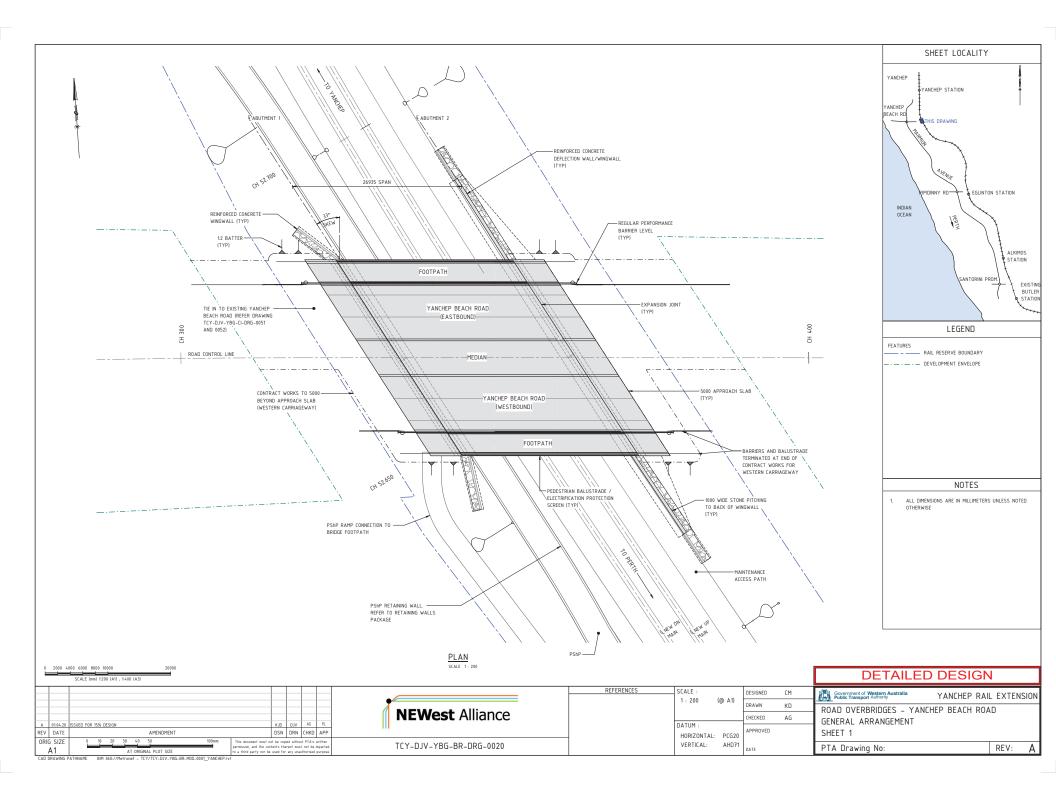


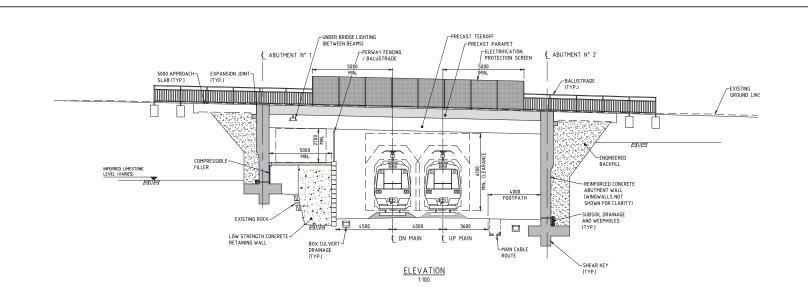
### NEWest ALLIANCE YANCHEP RAIL EXTENSION PACKAGE 05 - ROAD OVERBRIDGES YANCHEP BEACH ROAD (CH 52655)

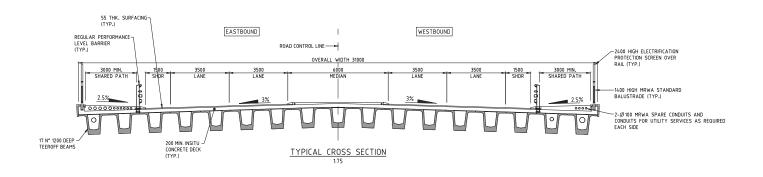
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A	TCY-DJV-YBG-BR-DRG-0005		LOCALITY PLAN
A	TCY-DJV-YBG-BR-DRG-0020		GENERAL ARRANGEMENT - SHEET 1
A	TCY-DJV-YBG-BR-DRG-0021		GENERAL ARRANGEMENT - SHEET 2





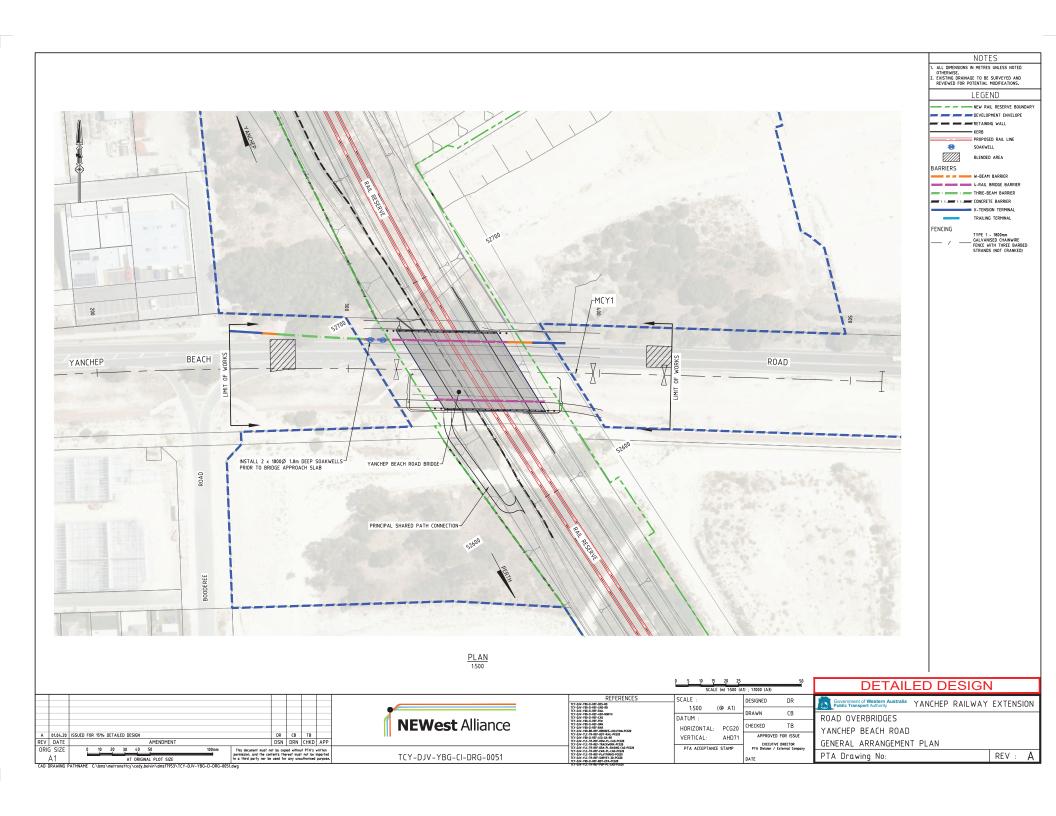


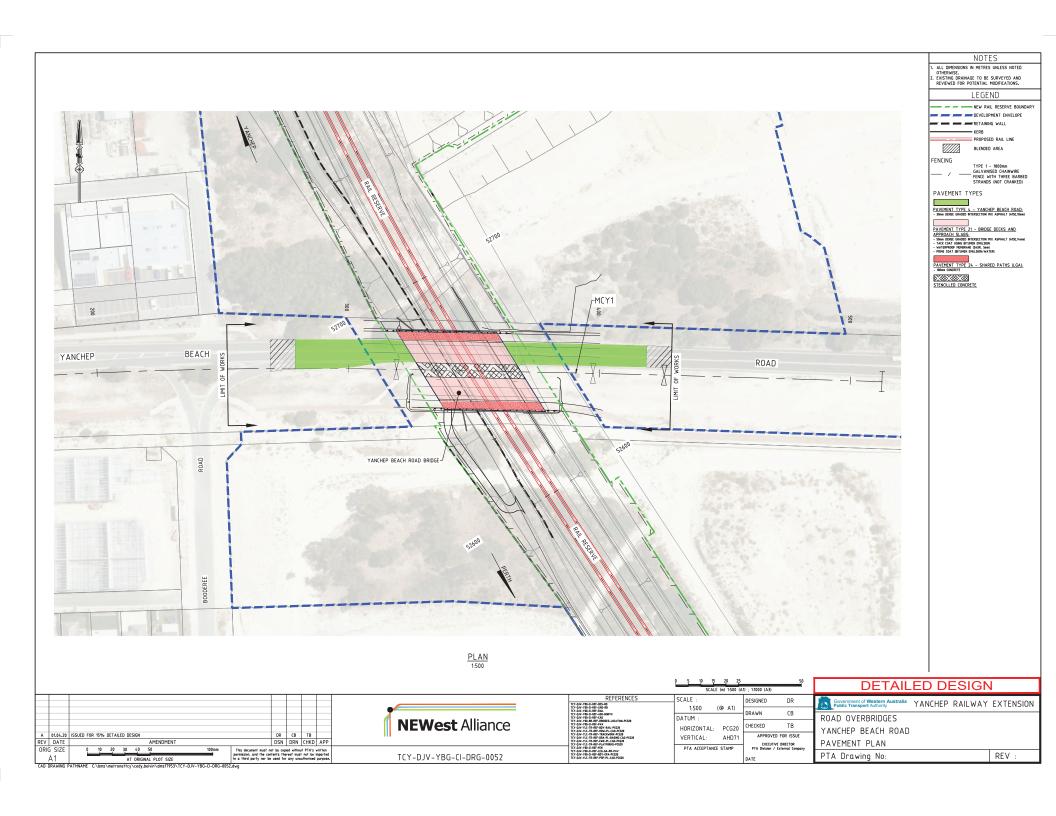


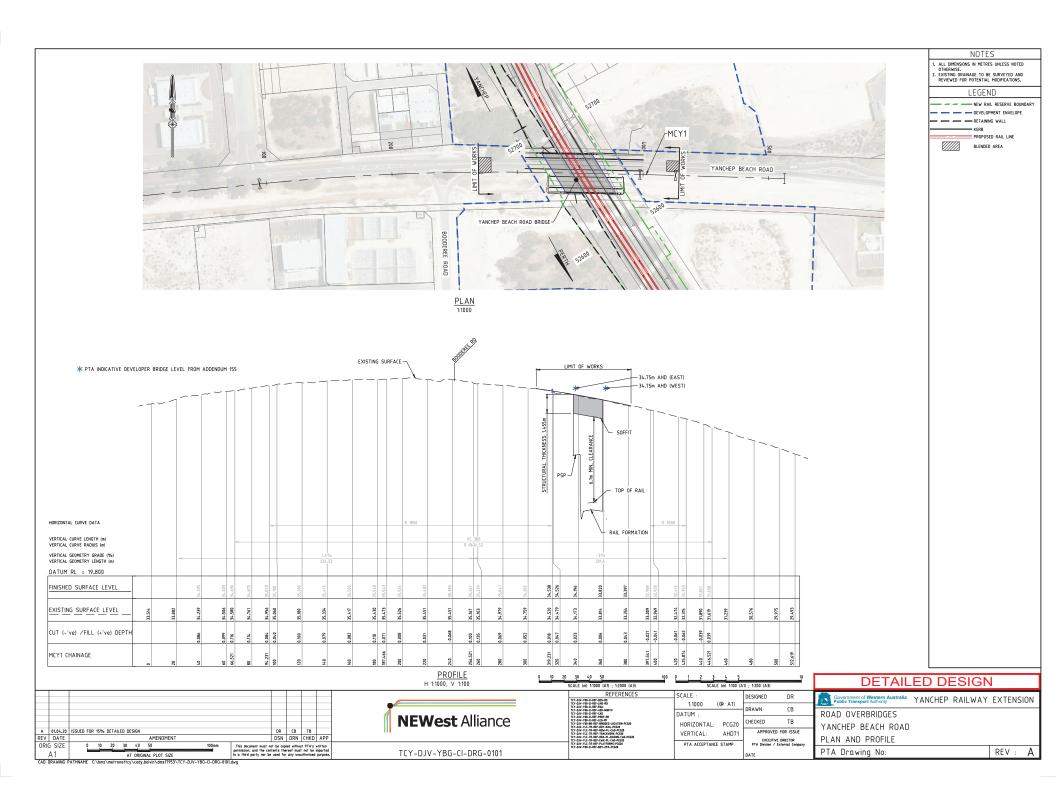




					DETAILED DESIGN
		REFERENCES TCY-DJV-Y00-BR-REF-BRIDGE-PROF	SCALE : 1:100 (@ A1)	DESIGNED CM	Government of Western Australia YANCHEP RAIL EXTENSION
		TCY-DJV-YBG-BR-REF-BRIDGE-XS	DATUM :	DRAWN GH	ROAD OVERBRIDGES - YANCHEP BEACH ROAD
	<b>NEWest</b> Alliance		HORIZONTAL: PCG2	O CHECKED AR	GENERAL ARRANGEMENT
A 01.04.20 ISSUED FOR 15% DESIGN CM GH AR PL			VERTICAL: AHD?		
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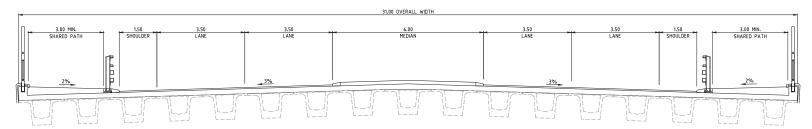






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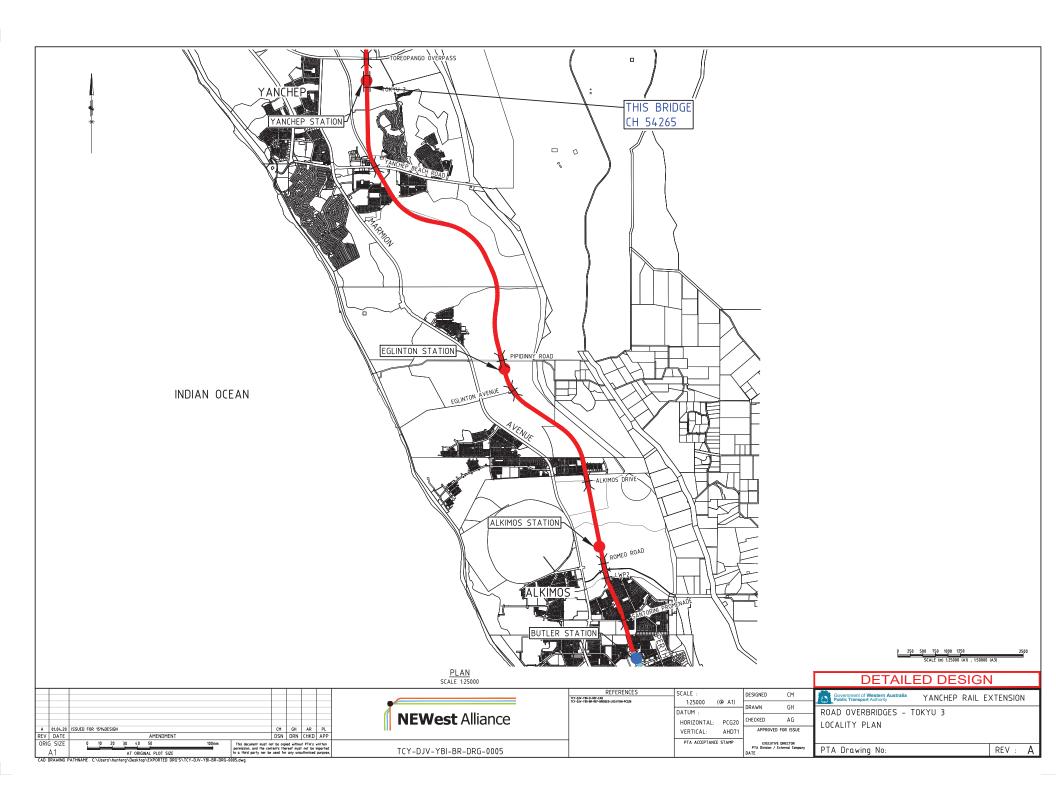


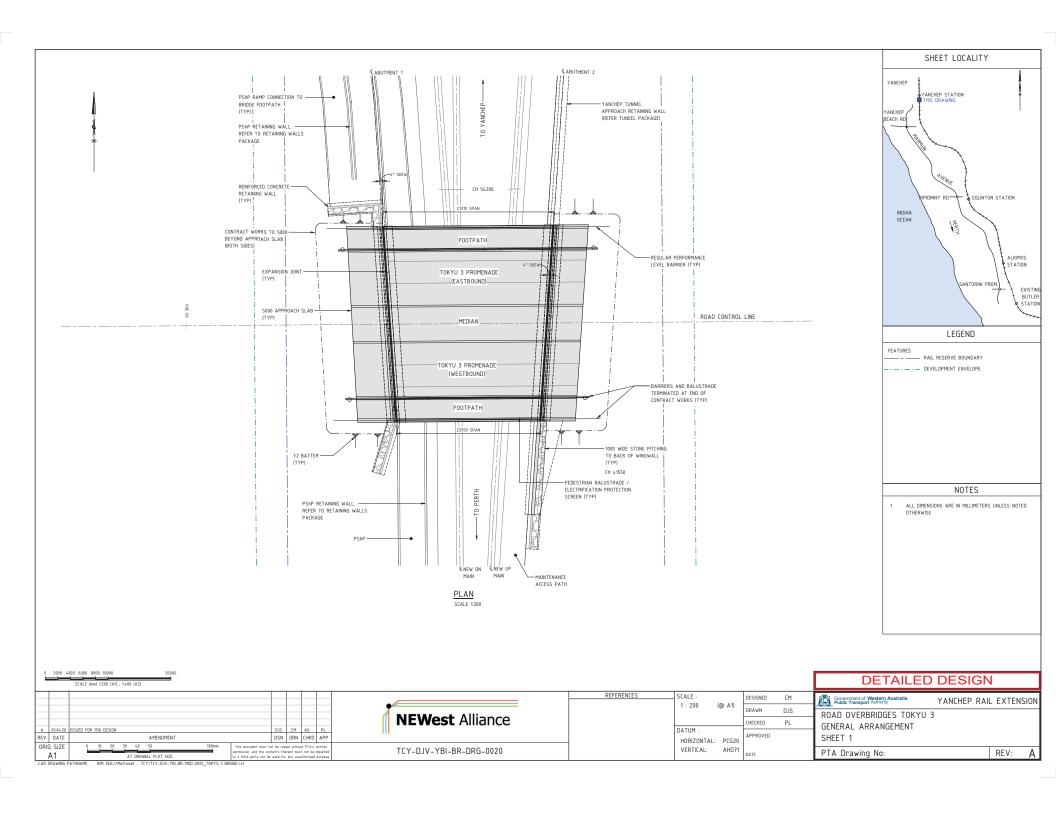
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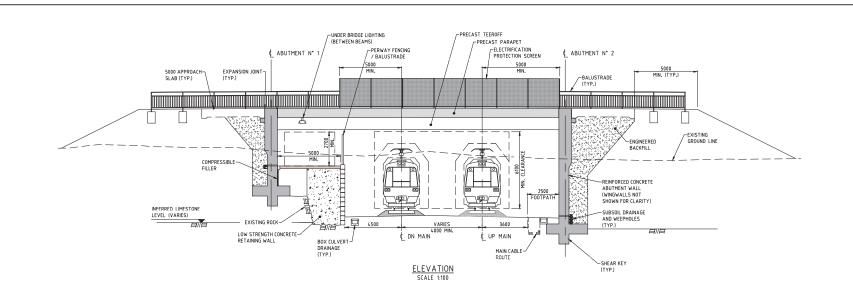
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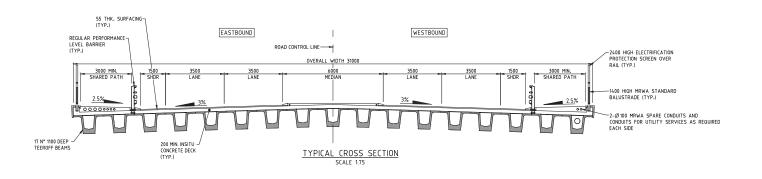
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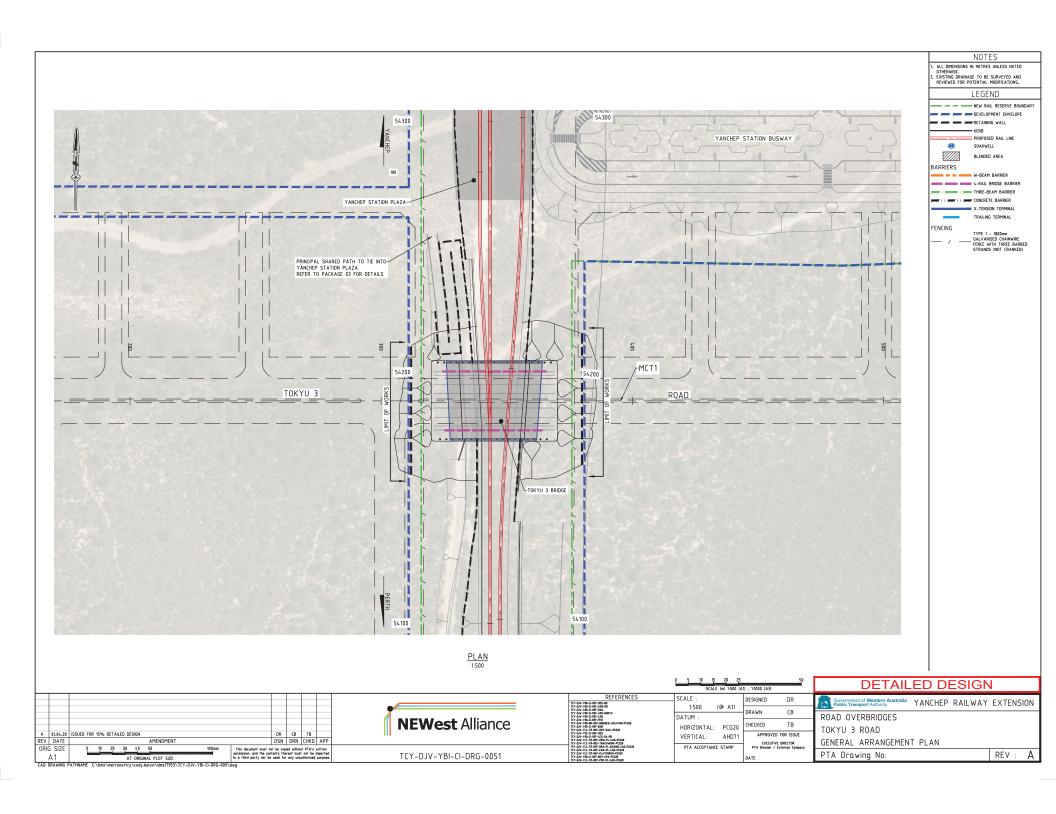








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## APPENDIX E LANDSCAPE PLAN

# NEWest ALLIANCE YANCHEP RAIL EXTENSION

YANCHEP STATION - LANDSCAPE PACKAGE YSC LANDSCAPE - DETAILED DESIGN

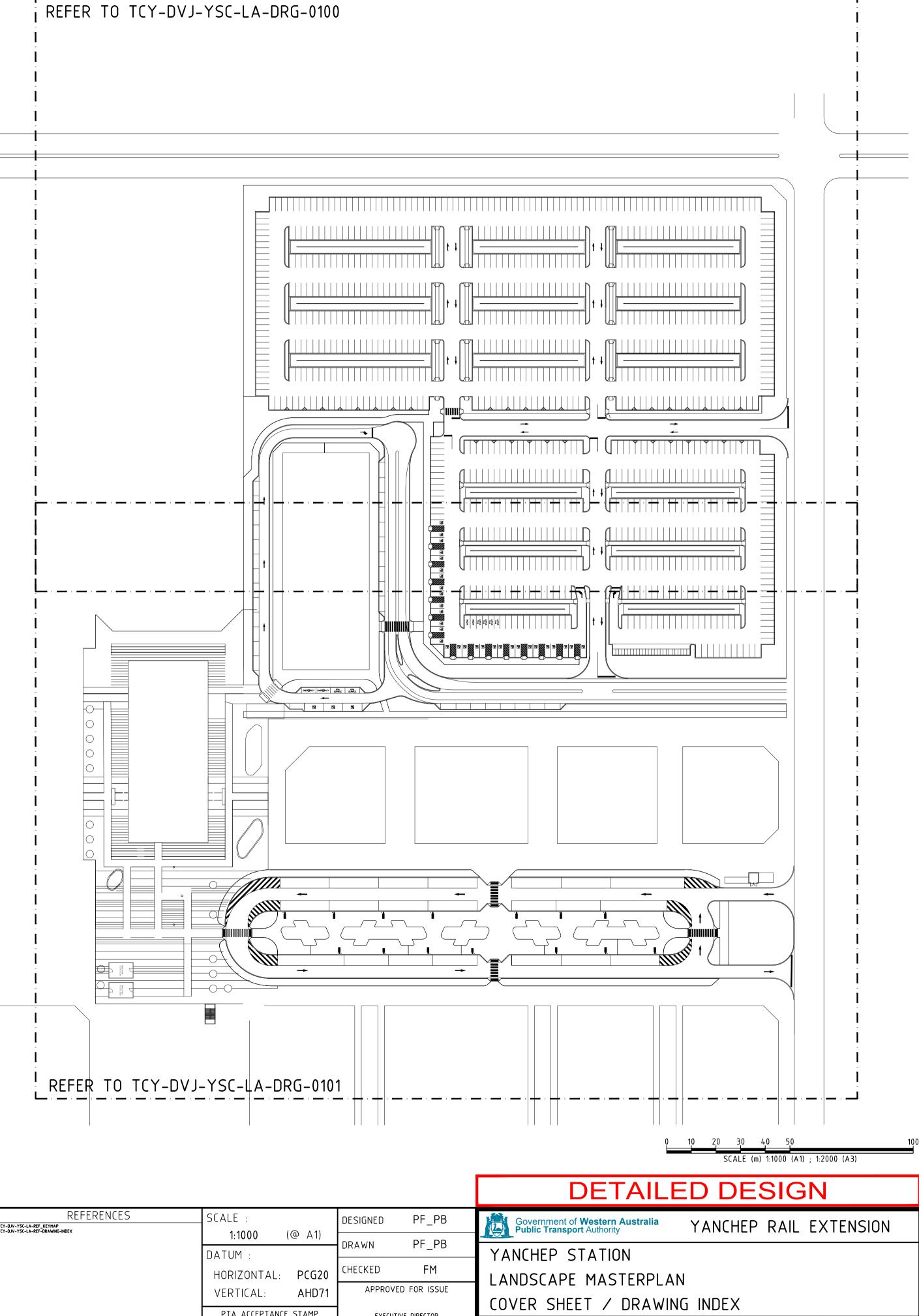
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TCY-DJV-YSC-LA-DRG-0002		YANCHEP STATION - LANDSCAPE MASTERPLAN - PLANTING LIST / CONCEPT MATERIALS	NTS
TCY-DJV-YSC-LA-DRG-0011		YANCHEP STATION - LANDSCAPE MASTERPLAN - OVERALL PLAN	1:1000
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NOTE:

MASTER PLAN AND SURFACE FINISHES WERE COMPLETED IN AUTOCAD (MODEL STILL BEING TRANSFERRED TO REVIT). REMAINING SHEETS ALREADY IN REVIT.

CIVIL BACKGROUND USED IN THE CURRENT LANDSCAPE MASTERPLAN HAS IN PROJECTWISE ON 10.06.2020.



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**NEWest** Alliance

TCY-DJV-YSC-LA-DRG-0001

YANCHEP STATION - LANDSCAPE COVER SHEET

SCALE 1:1000

PTA ACCEPTANCE STAMP EXECUTIVE DIRECTOR

PTA Division / External Company

REV : A

PTA Drawing No:



Full Sun / Part Shade Flower: Spring Soil Type: All soils including coastal Size: 30-40cm (H) x 3m (W) (Available Benara Nursery)

Conostylis candicans

Type: Strappy Leaf

Flower: Winter / Spring

Soil Type: All soils

Size: 30cm (H) x 30cm (W)

(Available Benara Nursery)



Scaevola crassifolia Thick-leaved Fan Flower Type: Ground cover Full Sun Flower: Winter / Spring Size: 1m (H) x 1.5m (W) (Available Benara Nursery)

Dianella caerulea 'DCNC0' Breeze

Blue Flax Lily

Type: Grass

Full Sun / Part Shade / Shade

Soil Type: All soils including coastal

Size: 60cm (H) x 60cm (W)

(Available Benara Nursery)

Flower: Spring



(Available Benara Nursery)

Dianella revoluta DR5000

Flax Lily - Little REV

Type: Strappy Leaf

Full Sun / Part Shade

Flower: Spring

Soil Type: All soils

Size: 40cm (H) x 30cm (W)

(Available Benara Nursery)



Hemiandra pungens alba Type: Ground cover Full Sun to Full shade Flower: Summer Size: 30 cm (H) x 2m (W) (Available Benara Nursery)

Lepidosperma longitudinale

Pithy Sword Sedge

Type: Sedge - Stripy Leaf

Full Sun

Flower: Winter

Soil Type: All Soils

Size: 1m (H) x 50 cm (W)

(Available Benara Nursery)



'Pink cascade' (low form) Type: Ground cover Part Shade / Full Sun Flower: Autumn / Winter Soil Type: All soils including coastal Size: 50cm (H) x50cm (W) (Available Lullfitz Nursery)



Callistemon viminalis LJ1 Better John - Bottlebrush Type: Medium Shrub Full Sun / Part Shade Flower: Winter to Spring Soil Type: All soils Size: 0.60/1.2m (H) x 60/90cm (W) (Available Lullfitz Nursery)



## FEATURE LIMESTONE BOULDERS

- ON SITE DUG OUT LIMESTONE BOULDERS TO BE PLACED STRATEGICALLY ALONG THE LANDSCAPE MASTERPLAN;

- BOULDERS MAY VARY IN SIZE AND TEXTURE;

- TO BE PLACED IN LANDSCAPE SITTING BOTH VERTICALLY AND

HORIZONTALLY, PENDING ON LOCATION;

- LOCATIONS TO BE IMPLEMENTED AS DESIGN DEVELOPMENT PROGRESSES:

- LIMESTONE BOULDERS TO BE USED ALSO AS WAYFINDING FEATURES.



CONCEPTUAL PAVING MIX WAYFINDING THROUGH THE USE OF COLOUR MIXES THAT WILL GUIDE PEDESTRIANS TOWARDS THE MAIN **ENTRANCES OF THE STATION** 



Banksia nivea (syn) Couch Honeypot Type: Small Shrub Full Sun / Parth shade Flower: Autumn to Spring Size: 1m (H) x 1m (W)

(Available Lullfitz Nursery)

Xanthorrhoea preissii

Type: Large Shrub (Feature)

Light Shade / Full Sun

Flower: Summer to Winter

Soil Type: All soils (well drained)

Size: 2-4 m (H) x 2-4 m (W)

(Transplanted)



Full Sun Flower: Autumn to Spring Size: 1m (H) x 1.5m (W) (Available Lullfitz Nursery)

Adenanthos sericeus

Woolly Bush - 'Pencil Perfect'

Type: Large Shrub (Hedge)

Full Sun / Parte Shade

Flower: Spring / Summer

Soil Type: All soils

Size: 3 m (H) x 1 m (W)

(Available Lullfitz Nursery)

Little Red Banksia Type: Medium Shrub Full Sun / Part Shade Flower: Autumn / Winter I Type: All soils including coastal Soil Type: All soils including coastal Soil Type: All soils including coastal Size: 1m (H) x 1.5m (W) (Available Lullfitz Nursery)

Ficinia nodosa

**Knotted Club Rush** 

Type: Rush / Sedge

Light Shade / Full Sun

Flower: Summer to Winter

Soil Type: All soils including Coastal

Size: 1m (H) x 1m (W)

(Available Lullfitz Nursery)





Soil Type: All soils including Coastal

Size: 1m (H) x 50cm (W)

(Available Lullfitz Nursery)



Juncus krausii Sea Rush Type: Rush / Sedge Light Shade / Full Sun Flower: Spring / Summer



Westringia fruticosa WES04

Coastal Daisy Bush

Flower: Winter/Spring

Soil Type: All soils including coastal

Size: 40cm (H) x 45cm (W)

(Available Lullfitz Nursery)

Type: Small Shrub

Baumea Juncea Rush Rush Type: Rush / Sedge Light Shade / Full Sun Flower: Spring / Summer Soil Type: All soils including Coastal Size: 1m (H) x 1m (W) (Available Lullfitz Nursery)



REFERENCES



Melaleuca preissiana Modong / Stout Type: Small Tree Flower: Autumn All soils and wetlands Size: 5-6m (H) x 4-5 m (W) Root ball size: Available Benara Nursery)



Flooded Gum Type: Large Tree Full Sun Flower: Winter / Spring All soils and wetlands Size: 15 m (H) x 8 m (W) Root ball size: (Available Ellenby Tree Farm)



Banksia littoralis Swamp Banksia Type: Medium Tree Full Sun Flower: Autumn / Winter All soils and wetlands Size: 15 m (H) x 8 m (W) Root ball size: (Available Lullfitz Nursery)

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Type: Large Tree Full Sun Flower: Winter / Spring All soils including coastal Size: 15 m (H) x 8 m (W) Root ball size: (Available Lullfitz Nursery)



Eucaluptus gomphacephala Cupaniopsis anacardioides Tuckeroo Type: Medium Tree Flower: Summer/Autumn All soils including Coastal Size: 8 m (H) x 6 m (W) Root ball size: (Available Ellenby Tree Farm)



Agonis flexuosa WA Weeping Peppermint Type:Medium Tree Flower: Winter/Spring All soils (well drained) Size: 8 m (H) x 5 m (W) Root ball size: (Available Benara Nursery)



3 DIFFERENT SEATING ELEMENTS TROUGHOUT THE LANDSCAPE LAYOUT.

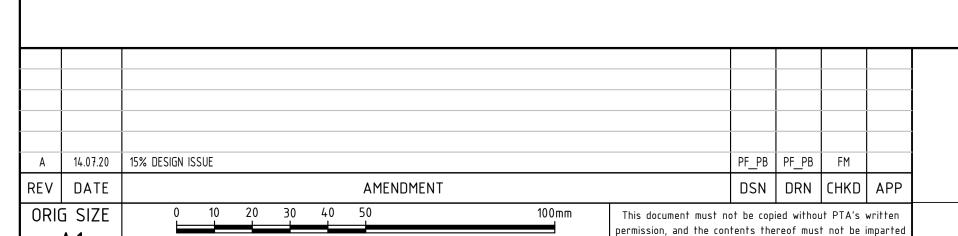
GARDEN BEDS IN A MORE ORGANIC SHAPE AS REFERENCE TO THE LIMESTONE BOULDERS THAT WILL BE USED IN THE PROJECT.

FEATURE GARDEN EDGE AND SEATING IN IN-SITU FORMED LIQUID LIMESTONE WITH TIMBER TOP SEATING ELEMENT IN ONE OF THE CORNERS. GARDEN BEDS TO HAVE TO TWO DIFFERENT SIZES (SMALL AND LARGE GARDEN BED).

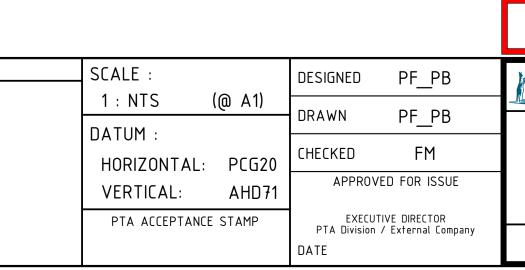
A RAISED PLANTER SIMILAR IN SHAPE BUT WITH A RAISED CORTEN STEEL CENTRAL PLANTER TO BE LOCATED IN THE SUSPENDED BRIDGE ABOVE THE RAIL TRACKS, WHERE PLANTING CAN'T BE ADDED DIRECTLY TO THE SOIL.

Architectural Concept (BANKSIAS - Banksia Mensiesii - ORANGE)

Selection of Banksias for Yanchep Station Landscape

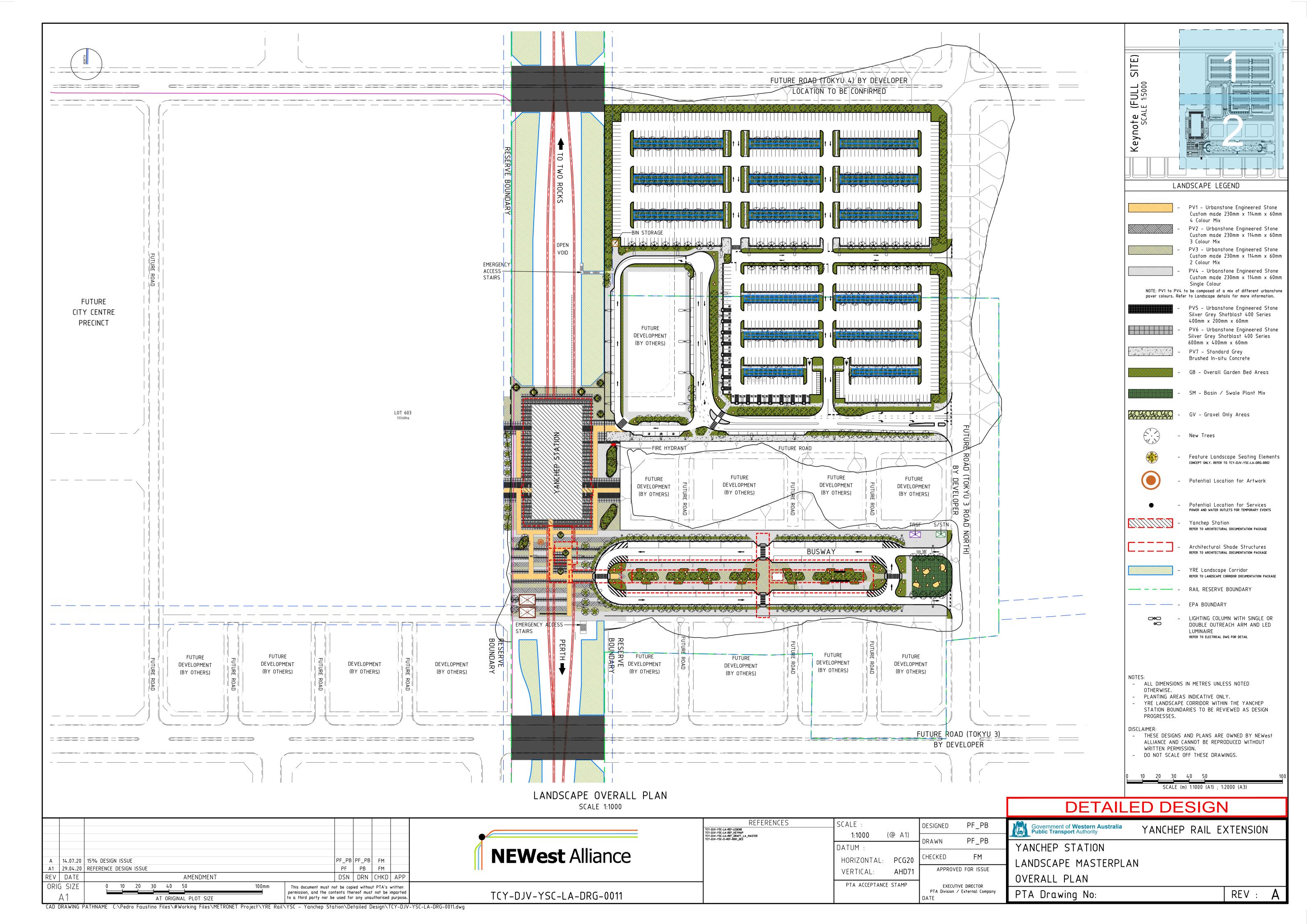




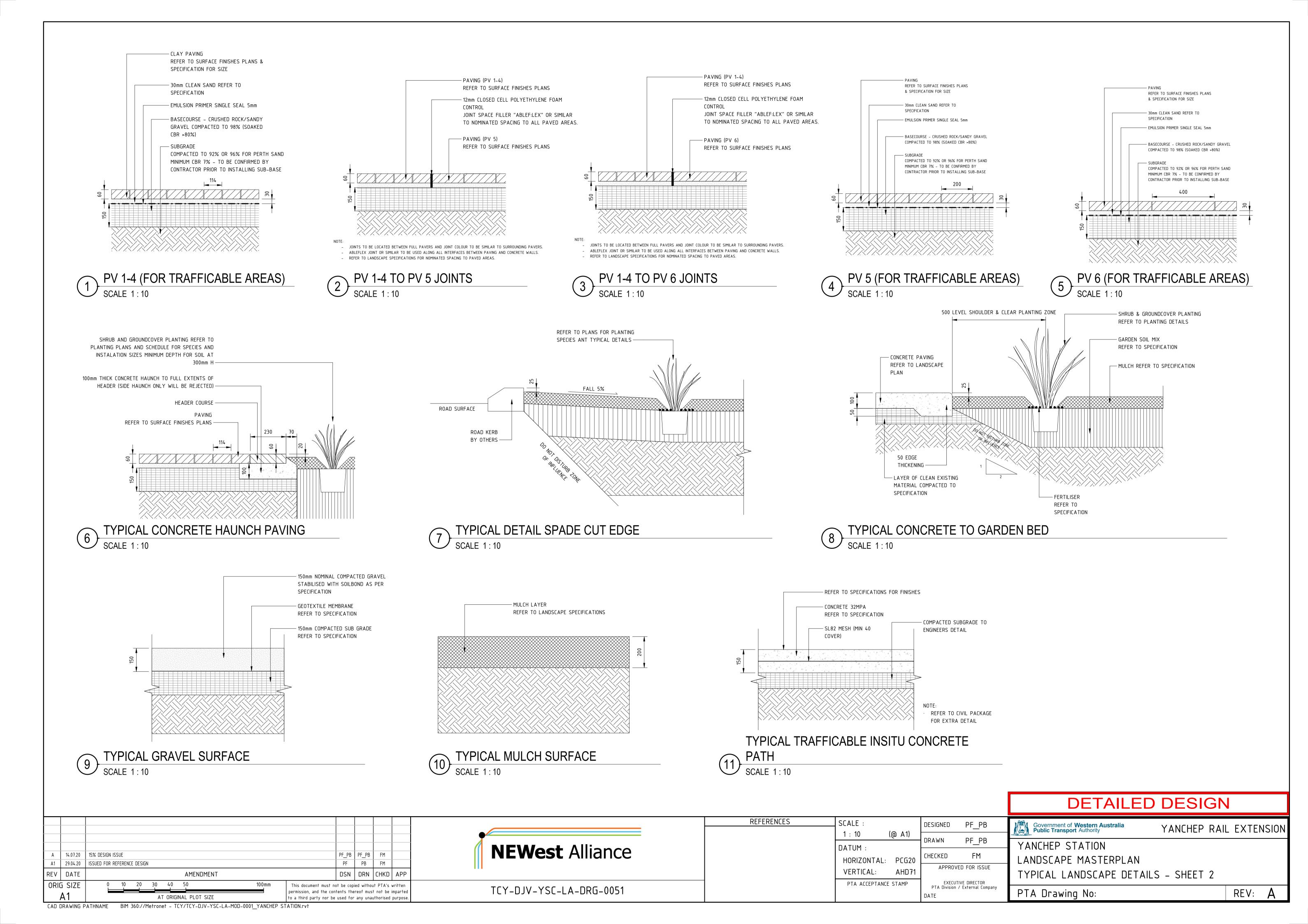


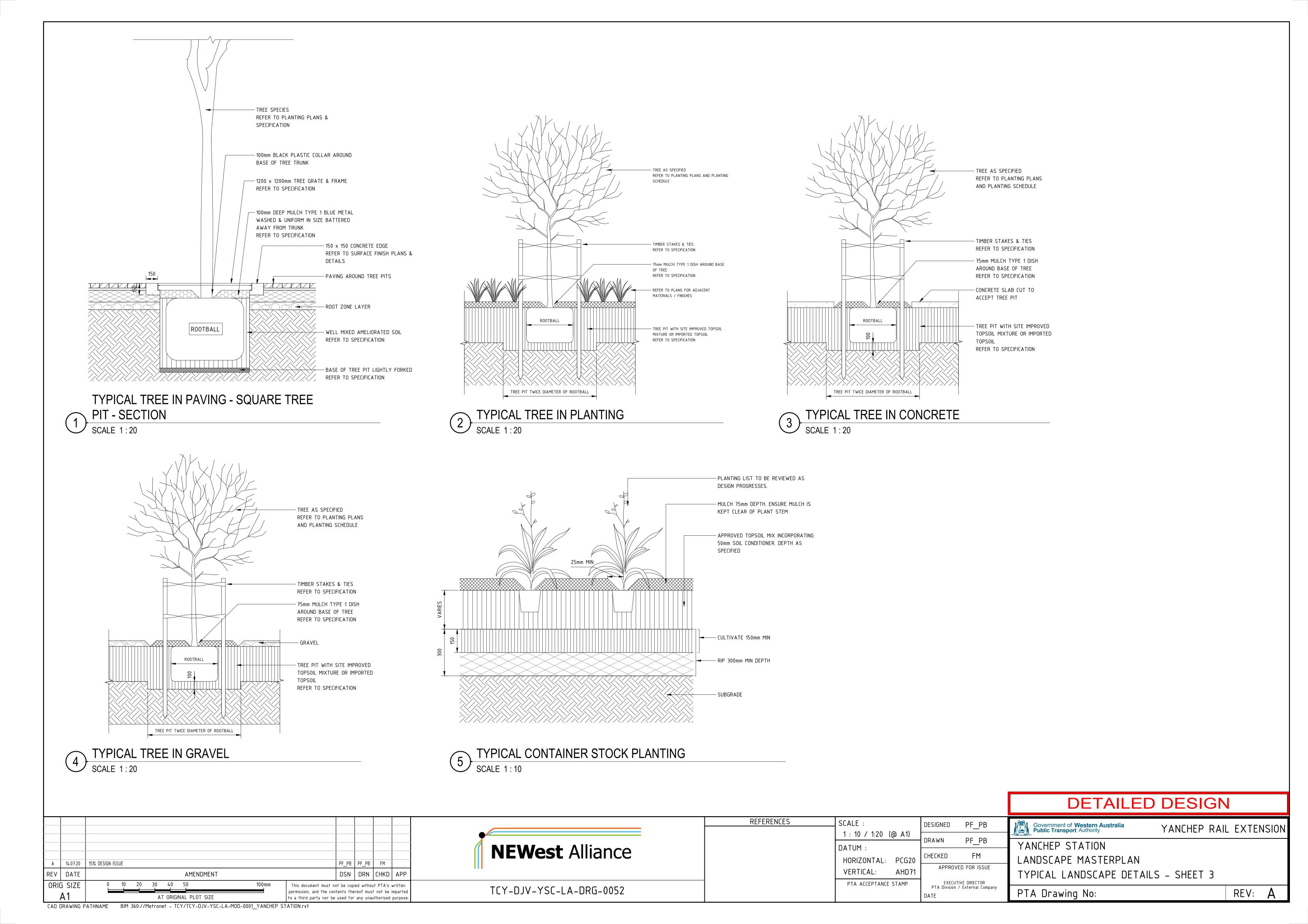


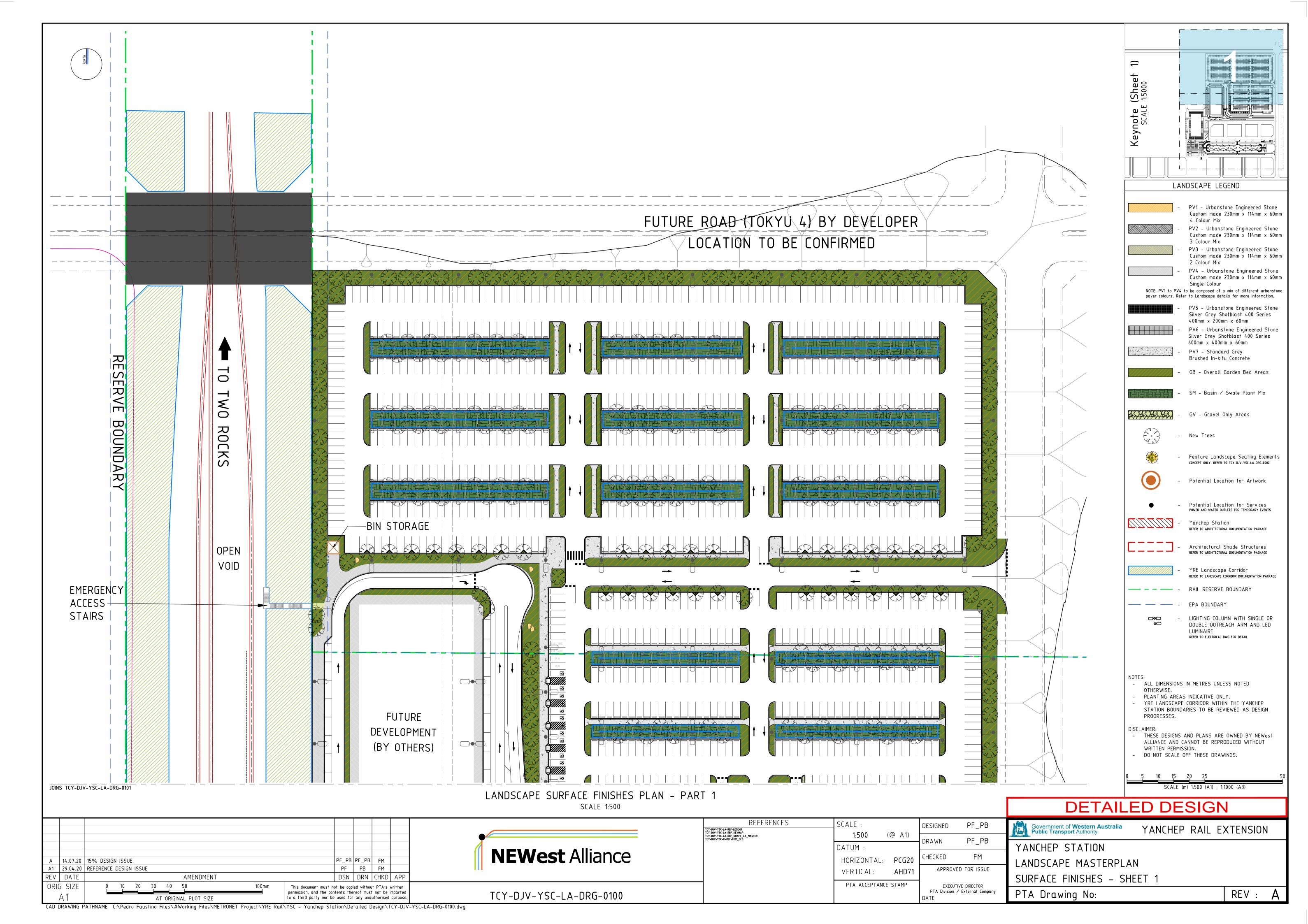
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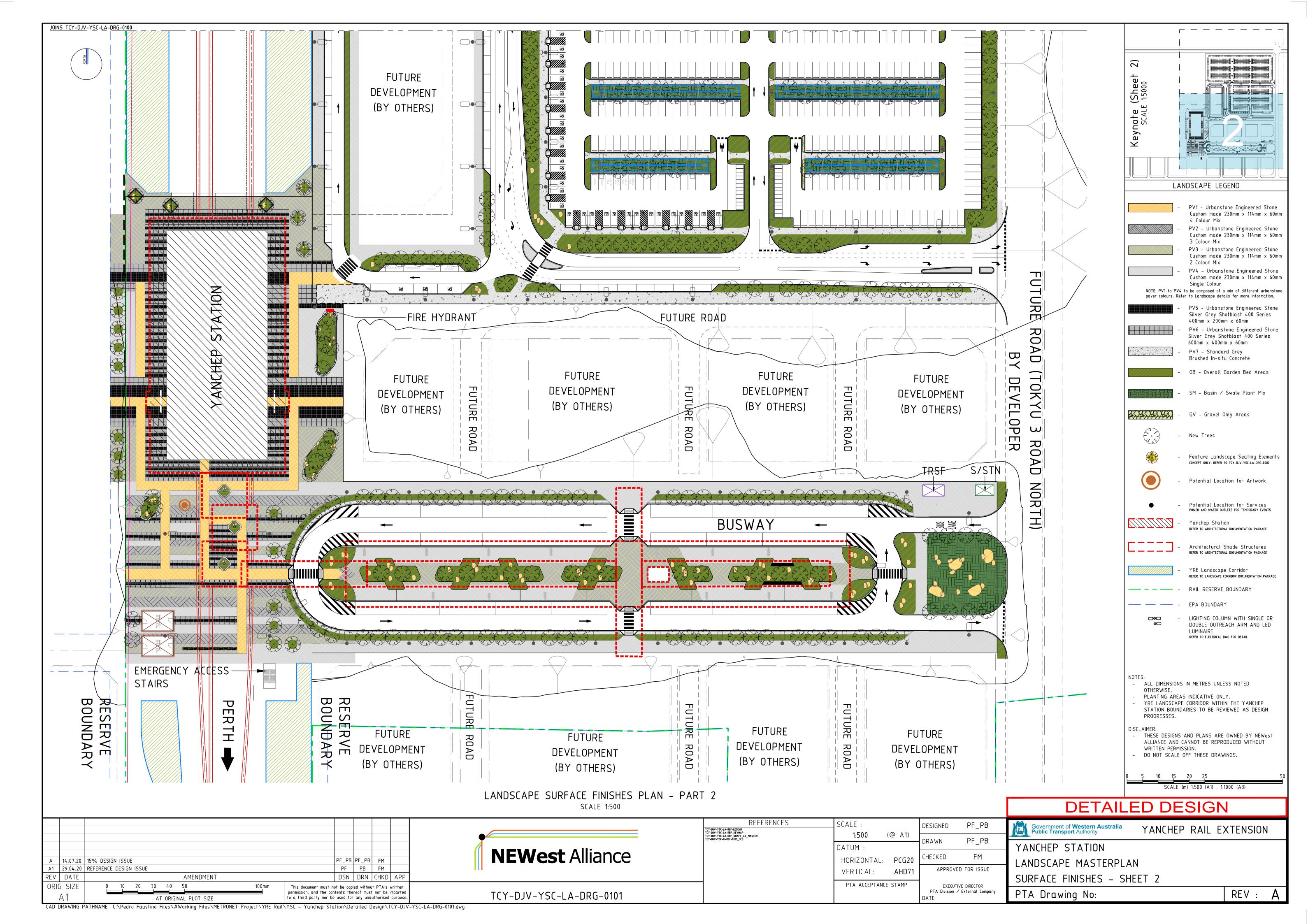












#### **APPENDIX F PUBLIC ART SUMMARY**

# TCY Public Art Summary Statement for DA Planning Reports

DRAFT 1.3, 24 Aug 20

For inclusion into the following applicants:

- Thornlie Station
- Yanchep Station
- Eglinton Station
- Alkimos Station
- Nicholson Road Station
- · Ranford Road Station.

#### **Public Art in new Stations**

#### Scope of Work for Public Art

The State Government's Percent for Art Scheme encourages art in the built environment by using a percentage of a development's overall budget to commission art on new public buildings such as schools, hospitals and railway stations. As such, the Percent for Art Scheme requires up to 1% of the construction budget for new works over \$2 million to be spent on artwork.<sup>1</sup>

METRONET Stage 1 program of works is supported by an endorsed Yanchep Rail Extension & Thornlie-Cockburn Link Projects Public Art Guide (April 2020), which is itself informed by the overarching METRONET Public Art Strategy (October 2019). These strategies draw inspiration from and respond to Perth's rich Aboriginal and local culture, history, landscape and place, with a thematic framework built around the Gnarla Biddi story of 'Our Pathways'.

Inclusion of public art in the design phase is essential for successful integration into infrastructure design and for optimal value for money. The purpose of the Public Art Guide for METRONET Stage 1 is to provide the NEWest Alliance with direction regarding the relevant themes to be explored through public art, opportunities for application of public art in the stations' architectural design, procurement, management and funding of public art installations for the Yanchep Rail Extension (YRE) and Thornlie-Cockburn Link (TCL) projects.

Public art plays a key role in enhancing the physical public realm of the new stations and expressing the local community's identity and 'sense of place' by responding to its specific cultural, historical, and environmental narratives.

In approaching the designing and development of the new railway stations, as both important public buildings and major transport hubs, it is acknowledged that public art that responds to the uniqueness of its site and is creatively integrated within the public realm has the ability to celebrate and connect with its local people, as well as attract, inform and educate commuters from the wider community.

The principles and objectives of METRONET'S Public Art Principles and Strategy Framework that will be applied to the public art developed in each new station are as follows:

Actual budgetary allowance will be reassessed by the PTA upon the engagement of, and with input from, the Public Art Coordinator and pending responses from the artists' concept proposal submissions.

#### **METRONET Public Art Principles**

- Place making: public art is integral to creating vibrant, usable areas, it encourages community
  use of place, aids understanding of place, history, cultural heritage Noongar and non-Noongar
   and provides new interpretations.
- Site specific: public art created for a specific location celebrates, commemorates and connects what is unique or special about a place, instils a sense of local pride/ collective identity and drives visitation. Site specific artworks encourage exploration through thought, action, a different perspective on the stories of our place and people.
- Scale and fit: the scale of artwork needs to be consistent with the artwork brief/intent i.e. it
  could be a landmark piece, a series or pieces, or a small element of surprise. Artwork scale
  also needs to be responsive to the site context such as the surrounding landscape and
  buildings and pedestrian circulation.
- Universal accessibility: public art should be made accessible to all members of the community, irrespective of their age, abilities or cultural background. Consider works that engage multiple senses – sight, sound, touch, smell and/or taste.
- Attractor: public art can be used as an 'attractor' for visitors and tourists particularly places with landmark artworks or seasonal art programmes. Such cultural tourism can provide a significant economic return to places/ cities with visitor-attracting iconic artworks.
- Sustainable: art is designed considering key environmental, social and economic opportunities for both procurement/delivery and ongoing function and use.
- Well considered and managed: artworks must be designed and constructed with best practice
  risk and asset management, being mindful of public safety, straightforward and low cost
  maintenance, resistance to vandalism, and constructed with robustness appropriate for the
  lifespan of the artwork.

#### **METRONET Public Art Strategy Objectives**

- Drive the delivery of a diverse program of high quality progressive, bold, meaningful and inspiring public art that is valued by the community.
- Support the appeal and legibility of public spaces connected to stations and other transport infrastructure by creating points of interest, supporting walkability and building a sense of adventure.
- Showcase local culture, build place identity and animate public spaces to make them a more enjoyable.
- Celebrate, respect and acknowledge Australia's First People by promoting, engaging and responding to local Aboriginal culture, community, heritage and history.
- Encourage creativity and innovation and support the development of creative capital and sustainability of the local arts sector.
- Leave a positive project legacy to acknowledge the significance of METRONET.

In addition, the Gnarla Biddi METRONET Aboriginal Engagement Strategy also critically informs landscaping and architectural design elements including the creation of public art at each new station, as guided by the following interrelated context setting documents:

- METRONET Noongar Cultural Context Wadjup Thornlie-Cockburn Link Project; and
- METRONET Noongar Cultural Context Yanchep (Mooroo) Rail Extension Project.

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#### **Public art for Placemaking**

The brief for the development of public art in any station is that it must be integral to vibrant, usable and activated spaces, that aids understanding of place, history, cultural heritage (Noongar and non-Noongar) and provides new interpretations. As such, the design of public artworks is to fulfil the following objectives and guiding principles of:

- To promote community engagement
- To enable community capacity building
- To ensure safety
- To support wayfinding.



METRONET public art guiding principles

#### **Delivery Program for Public Art**

The Public Art Plan for TCL and YRE is to guide the engagement of the Public Art Coordinator, who will have responsibility for implementing the strategy and Public Art Guide into the development of each new station project. The scope of the Public Art Coordinator's role in implementing the strategy includes:

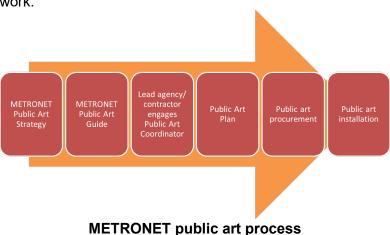
- Coordination and management of all aspects of the artist procurement, design, development, installation and commissioning of all station artwork projects.
- Producing a Public Art Plan each for the YRE and TCL that are in line with the METRONET Public Art Strategy and Gnarla Biddi METRONET Aboriginal Engagement Strategy and approved by the strategys' respective coordinators.
  - Public Art Plans are to include a Sense of Place Statement (n.b. may be a separate document) for each station that draws on the different cultural, geographical, sociological, environmental and historical narratives from the surrounding local area. The Sense of Place Statement sets the curatorial vision for each station's artwork, parameters for its integration, a delivery guide, fabrication details and budget for the artwork at each station.
- Preparation of a procurement plan and relevant documentation, which will include Artwork Brief
  requesting demonstrated adherence to the objectives of the METRONET Public Art Strategy
  and Request for Quotation (RfQ) documents; and coordination of artists during the design and
  development process, to ensure that the public art produced for the project satisfies the
  requirements as described in the RfQ and briefing documents.
- Collaboration and liaison with relevant internal and external stakeholders, the design and construction project teams, and public consultation if required. Key stakeholders that have been identified include, but are not limited to, the following:
  - PTA,
  - METRONET Office,
  - METRONET Noongar Reference Group, and
  - the Local Government specific to each station's locality.

NEWest Alliance Page 3 4

 Assisting the artist with preparing any documentation for building certification and permits, if required.

For artwork to be successfully integrated within the station's landscaping, infrastructure and building design - the Public Art Coordinator will liaise closely with METRONET's Program Strategy Coordinator and artist(s) during the project's detailed design phase. The proposed timeframe for delivery is as follows:

- engagement of Public Art Coordinator
- production and approval of Public Art Plans, EOI and Artwork Brief documents
- advertising of EOI and shortlisting of artist's concept proposal submissions for selection
- · commissioning of artists
- 50% design assessment
- fabrication completion
- installation of artwork.



#### • •

#### Timing of Implementation for Planning and Building Development Approvals

Given the robustness and timeframe of the public art delivery program, it is recommended that the public art component of the project be delivered prior to the commissioning and opening of the new station, as this enables synchronisation with other nontangible community development actions associated with leading up to and on Day One Operations.

As such, details of the ultimate public art installations proposed will be documented for the purposes of satisfying the condition in plan and elevation drawings, along with an associated artist design report. Together, the drawings and report materials will need to demonstrate that the proposed public art installations can be properly integrated with the approved architecture and landscaping of the station precinct.

Consequently, the following draft condition is provided for consideration in any resulting development approval:

Public art is to be provided in accordance with the State Government's Percent for Art Scheme, details of which are to be submitted prior to occupation, to the satisfaction of the WAPC in consultation with the Local Government.

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#### APPENDIX G **YRE CONSULTATION SUMMARY**

### YRE Community and Stakeholder Consultation Summary Statement for DA Planning Reports

DRAFT 1.2, 21 Aug 20

#### Overview

The NEWest Alliance strategic approach to engagement is based on the International Association of Public Participation (IAP2) Consultation Spectrum. Stakeholders are profiled and the engagement methodology tailored to provide the appropriate level of involvement in the project's designing and decision-making processes.

Since the 2017-18 State Budget announcement confirming funding for the Thornlie-Cockburn Link (TCL) and Yanchep Rail Extension (YRE), engagement with stakeholders has been undertaken by the Public Transport Authority (PTA) and the METRONET Office of the Department of Planning, Lands and Heritage (DPLH).

Since the awarding of the contract in November 2019, NEWest Alliance has further developed the reference designs for each station in consultation with the community and key stakeholders through a series of briefings, technical workshops, reference groups and responses to enquiries.

#### **Key Statistics**

Between 1 November 2019 to 31 July 2020, the NEWest Alliance had 174 interactions with 171 distinct stakeholders.

The greatest proportion of stakeholders consulted were community members (25%), local government (19%), community interest groups (12%), community reference group (9%) and general public (9%).

The main mechanisms for engagement were meetings with key stakeholders (22%), email enquiries (21%), email responses (16%), targeted mail (9%) and briefings and presentations (8%).

#### **Consultation Program Summary**

Level	Engagement	Engagement Stakeholders		Timing
Strategic	METRONET Local Government Reference Group – executive level	City of Wanneroo, METRONET Office, NEWest Alliance	Introduction to the NEWest Alliance	Quarterly
			Environment and Construction, Stations and Precincts, Interface and Engagement	
	METRONET Noongar Reference Group	Whadjuk Noongar community representatives, METRONET Office, NEWest Alliance	Introduction to the NEWest Alliance Yanchep Rail Extension design workshop	Quarterly and as required
	METRONET Access and Inclusion	METRONET Office, Department of	Introduction to the NEWest Alliance	Quarterly and as required

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Level	Engagement	Stakeholders	Topic/Discussion	Timing	
	Reference Group	Communities, Housing Advisory Unit, PTA, AIRG representatives	Lifts, respite seating, accessibility of car bays, drop off areas		
Operational	City of Wanneroo Briefings – officer level	City of Wanneroo, NEWest Alliance	Construction, Design, Environment, Community, Approvals	Quarterly	
	Technical / targeted workshops	Water Corporation Telstra Western Power ATCO Gas Environmental Protection Agency DevelopmentWA Transperth DFES	Design, Construction Staging, Approvals	Fortnightly, Monthly or as required	
Tactical	Yanchep Rail Extension Community Reference Group	City of Wanneroo, local residents, environmental groups	Construction, Design, Communications	Quarterly	
	Yanchep Rail Extension Communications Coordination Meeting	City of Wanneroo, Main Roads WA, Development WA, Water Corporation, METRONET Office	Communications / cross promotional opportunities	Quarterly	
	Trinity at Alkimos Residents Association	City of Wanneroo (mayor and elected member), local residents, NEWest Alliance	Project scope, stations, forward works, introduction to NEWest Alliance.	March 2020	

Face to face engagement has been supported by communication campaigns and response to enquiries. Approximately 380 notifications have been distributed to local residents and business to inform them of early works, geotechnical investigation, and temporary traffic changes with a further 80 properties directly engaged via doorknocks.

#### **Pre-Lodgement Meetings for Station Planning and Development Approval**

Station	Responsible Authority	Date
Alkimos*	City of Wanneroo / DPLH for WAPC	17 August 20
Eglinton*	City of Wanneroo / DPLH for WAPC	14 July 20

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Station	Responsible Authority	Date
Yanchep*	City of Wanneroo / DPLH for WAPC	14 July 20

Note: \* Project development site is located within a Planning Control Area (PCA).

#### **Upcoming Communication and Engagement**

 Community Drop-In sessions planned to be held locally over two Saturdays, 5 September 2020 (venue Butler Community Centre, Butler) and 12 September 2020 (venue Oldham Park Clubrooms, Yanchep)

The drop-in sessions will give the community an opportunity to find out more about the project's progress and plans, ask specific questions and raise concerns as well as understand how the project will help enhance Perth's growing northern suburbs.

- Business readiness workshops partnership with Small Business Development Corporation
- Fact sheets/construction updates (by zone) / release of renders and Augmented reality
- Property precondition surveys to 50 metres
- Site mobilisation engagement including doorknocks
- Quarterly briefings October 2020
- Postcode wide distribution of Project Updates planned for September 2020, to the following suburbs: Eglinton, Yanchep, Butler, Alkimos, Jindalee.

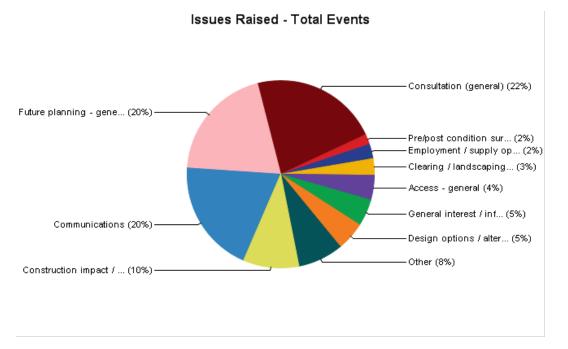
NEWest Alliance Page 3 6

### Yanchep Rail Extension (YRE) Consultation Outcomes Statistics

Date Range 1 November 2019 to 31 July 2020

#### **Key Issues Raised**

L	Forests	Stakeholders		
Issues	Events	Distinct	Total	
Consultation (general)	62	104	224	
Future planning - general	56	50	67	
Communications	55	55	165	
Construction impact / notices	27	46	51	
Design options / alternatives	14	13	13	
General interest / information	13	47	50	
Access - general	12	12	12	
Clearing / landscaping / revegetation	8	54	54	
Employment / supply opportunities	7	6	7	
Pre/post condition survey	5	4	5	
Other	22	97	98	
[No Issues]	4	13	13	
Total Events	174	171	358	

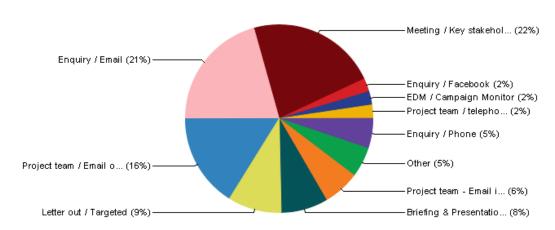


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#### **Event Types**

Event Types	Events	Stakeholders	
		Distinct	Total
Meeting / key stakeholder	39	27	44
Enquiry / email	36	36	43
Project team / email out	28	28	128
Letter out / targeted	16	1	1
Briefing / presentation	14	36	59
Project team - email in	11	10	10
Enquiry / phone	9	8	9
Enquiry / Facebook	4	3	3
Project team / telephone out	4	4	4
EDM / Campaign Monitor	4	0	0
Other	9	57	57
Total Events	174	171	358

**Event Types - Total Events** 

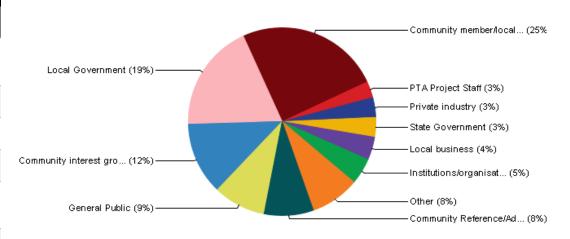


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#### Stakeholders Consulted

2/11/11/2		Stake	Stakeholders		
Stakeholder Groups	Events	Distinct	Total		
Community member / local resident	44	32	147		
Local Government	33	27	69		
Community interest group	22	7	23		
General public	16	17	20		
Community Reference / Advisory Group member	15	7	80		
Institutions / organisations	8	6	9		
Local business	7	5	9		
Private industry	6	5	6		
State Government	6	7	9		
PTA project staff	5	3	5		
Other	15	13	15		
[No Stakeholder Groups]	66	90	211		
Total Events	174	171	358		

#### Stakeholders Consulted - Total Events



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#### **APPENDIX H CATCHMENT ANALYSIS MEMO**

### **Memorandum**

Date	13/07/2020
То	Willem du Toit,
	Rob Forbes
From	Hugo Nilsson
	Teressa Matassa
CC	Thor Farnworth, John Caveill, Chris Deshon, Brad Sherlock, Param Lobana,
	Patrick Thompson, Gary Jones, Guy Smith, Martijn Van Het Kaar, Andy Godden
Subject	Yanchep Station Pedestrian Catchment Analysis
Doc No.	TCY-DJV-YSC-TM-MMO-0001
Revision	A

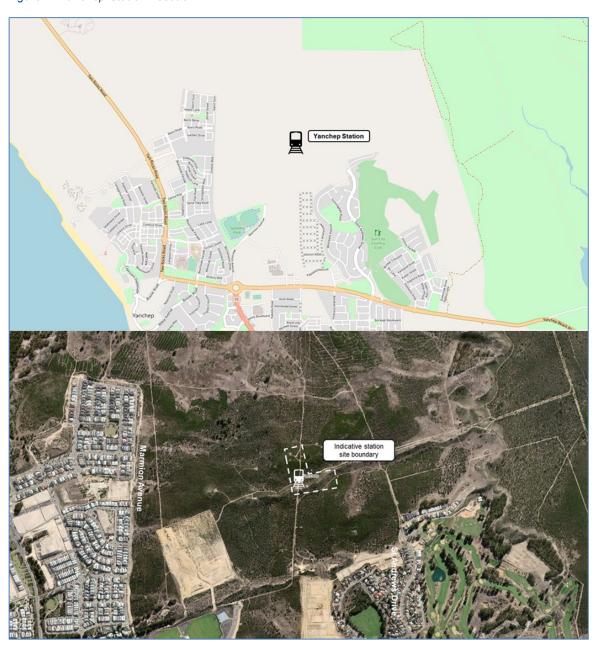
This memo outlines the methodology and findings for the pedestrian catchment analysis for Yanchep Station on the planned Yanchep Rail Extension (YRE).

Yanchep Station is proposed to be located to the east of Marmion Avenue and north of Yanchep Beach Road as indicated in Figure 1. The site currently consists of greenfield, undeveloped land but extensive future development is planned around the station and forms the basis of the assumed future transport connections and activities.

#### 1.0 Pedestrian Catchment Analysis

The pedestrian catchment analysis identifies the main potential sources of patronage demand accessing the station on foot and the likely resulting pedestrian desire lines, based on the surrounding future population, employment and land use data.

Figure 1. Yanchep Station Location



#### 1.1 Land Use and Patronage Origin

Future (2031) population and employment data was gathered from the 1.6.1 version of the Metropolitan Land Use Forecasting System (MLUFS). Data was gathered for zones within a 1.6-kilometre<sup>1</sup> catchment from the station as shown in Figure 2.

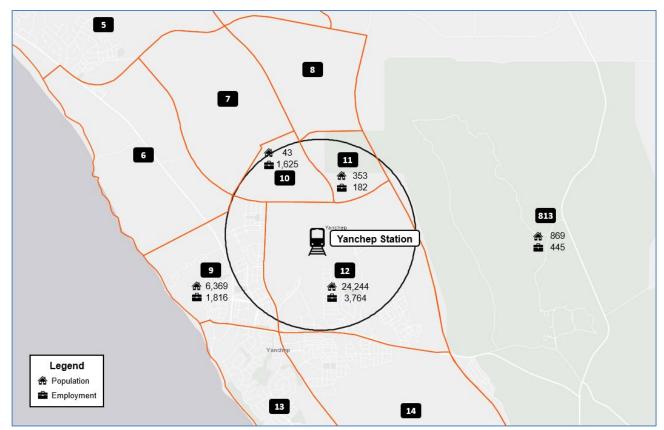


Figure 2. MLUFS Zones and Population Data relevant to the Yanchep Station Pedestrian Catchment

A desktop analysis was carried out to determine the overlap of each MLUFS zone falling within the potential 1.6-kilometre station catchment. The overlaps were used to estimate the forecast 2031 residential population and employment numbers within the catchment, which subsequently served as an indication for the relative contribution of each MLUFS zone to the future station patronage. A summary of the analysis is provided in Table 1.

MLUFS Zone	Residential Population	Employment	Total	Overlap	Total within Catchment	Relative Patronage Origin
9	6,369	1,816	8,185	40%	3,274	12%
10	43	1,625	1,668	90%	1,501	6%
11	353	182	535	90%	482	2%
12	24,244	3,764	28,008	75%	21,006	80%
813	869	445	1,314	3%	39	0%

<sup>&</sup>lt;sup>1</sup> 1.6 kilometres represents the maximum extent of a 20-minute walking catchment (the actual 20-minute catchment will be less than this due to indirect walking routes or crossing barriers)

### **Memorandum**

The patronage origin proportions were then revised to consider the extent of existing land use and any proposed developments which would result in sections of a zone with higher density population or employment, or non-urban areas with little or no population.

Currently, the area surrounding Yanchep Station is mostly greenfield, with existing residential development occupying Zone 9 to the west, and part of Zone 12 in the south.

The area to the north of the future Toreopango Avenue (Zone 10 and Zone 11) consists primarily of undeveloped land. In the future, Zone 10 in the northwest is planned for residential, mixed-use and business uses, whilst Zone 11 in the northeast is planned to comprise predominately service industrial, business, residential land-uses and open public space. Approximately half of Zone 11 is not zoned for future urban development. Therefore, as almost all of the planned urban development within Zone 11 falls within the potential Yanchep pedestrian catchment, the proportion of the Zone 11 population which is considered to 'overlap' with Yanchep Station pedestrian patronage was increased .

The area to the west of Marmion Avenue (Zone 9) comprises almost entirely of existing residential areas with a few scattered open public spaces. A public school and small mixed-use areas already exist in the zone. Considering most of the non-developable land is located outside the potential Yanchep pedestrian catchment, the patronage proportion was also adjusted for Zone 9. This zone will be an important source of patronage from the opening year as it contains the much of the existing development.

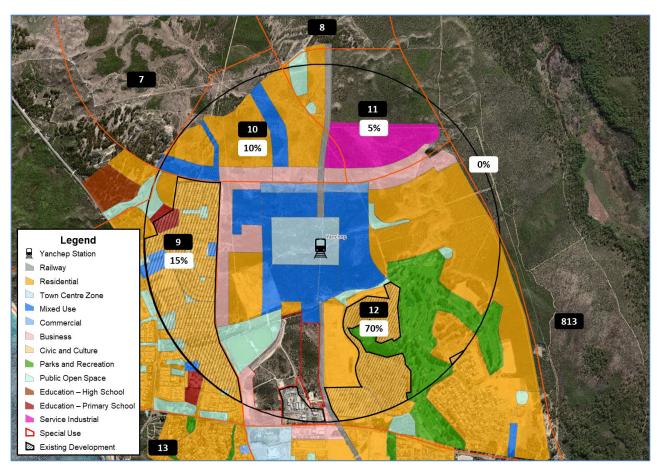
The station catchment is located predominately within Zone 12, which due to its proximity to the station and future mixture of high mixed use and town centre land-uses, is expected to be the main source of future patronage for Yanchep Station. Crucially, like Zone 9, this zone also contains much of the existing development which will be an important source of patronage in the opening year. The area also contains a significant proportion of parks and recreation areas, open public spaces and special uses areas. Overall, this region is still expected to generate most of the pedestrian demand to the station, however the patronage proportion was reduced slightly as significant areas of non-developable land falls within the potential catchment.

Land to the east of the future Mitchell Freeway (Zone 813) is occupied by Yanchep National Park, an area with negligible pedestrian trip generation. As such, the proportional patronage demand in this zone is set to zero.

The revised future patronage origins, along with an overview of the surrounding land use and proposed developments are shown in Figure 3. As these proportions are derived from a high-level desktop analysis, they are subject to a degree of uncertainty. For instance, they do not consider factors such as the potential differing commute habits between incoming workers and local residents travelling outbound and therefore, their potential to use the station.

### **Memorandum**

Figure 3. Surrounding Land Use and Proposed Future Patronage Origin Split



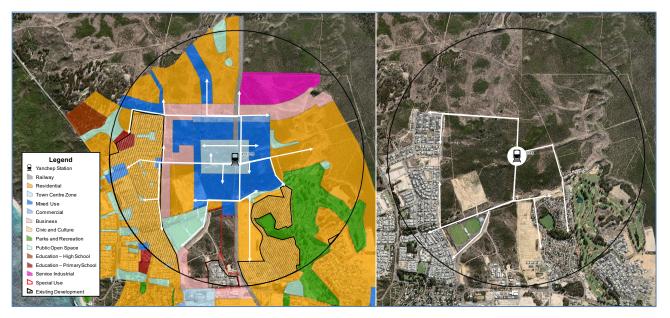
#### 1.2 Desire Lines

The patronage origin proportions derived in Section 1.1 were used to estimate the future main pedestrian desire lines to and from the station. As shown in Figure 4 the future main desire lines are estimated to radiate in all direction from the station and are likely to be distributed within the immediate surrounding Town Centre Zone. Desire lines are also expected to reach into the residential areas further afield from the station in all directions, with specific attractions being schools towards the west and business and service industrial areas to the north.

The interim pedestrian desire lines based on the existing development are also illustrated in Figure 4 and are expected to branch off to the existing residential areas to the south and west. This illustrates the key pedestrian catchment area for Yanchep Station at the time of opening, until the new development is delivered as anticipated in the STEM 2031 land use forecast.

### **Memorandum**

Figure 4. Future (left) and Interim (right) Pedestrian Desire Lines



#### 2.0 Surrounding Transport Network

An analysis on the surrounding transport network has been carried out to assess the current and proposed pedestrian network along with any barrier effects caused by the road network in order to determine whether the network can provide sufficient opportunities for pedestrians to access the planned station.

#### 2.1 Road Network

An assessment was carried out to determine the barrier effects caused to pedestrians by the future surrounding road network. The following City of Wanneroo adopted structure plans were used to determine the future road network:

- Yanchep City Centre Activity Centre Plan (2017)
- Capricorn Coastal Village Structure Plan (2017)
- Yanchep City Structure Plan (2012)

Overviews of the structure plans are provided in Figure 5, Figure 6 and Figure 7.

Figure 5. Yanchep City Centre Activity Central Plan

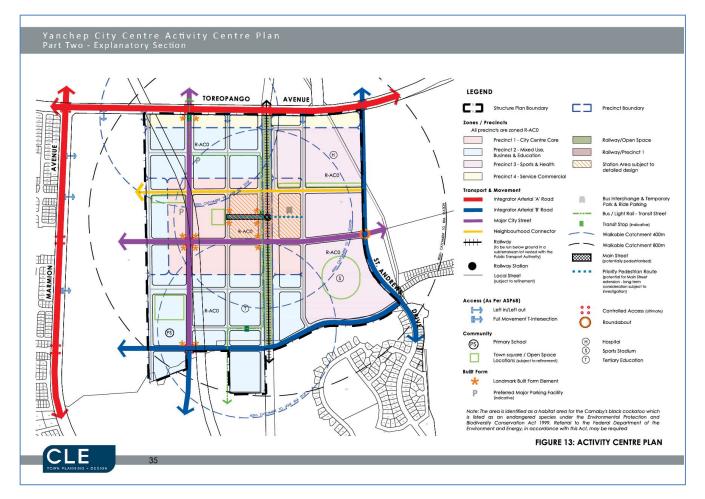


Figure 6: Capricorn Coastal Village Structure Plan

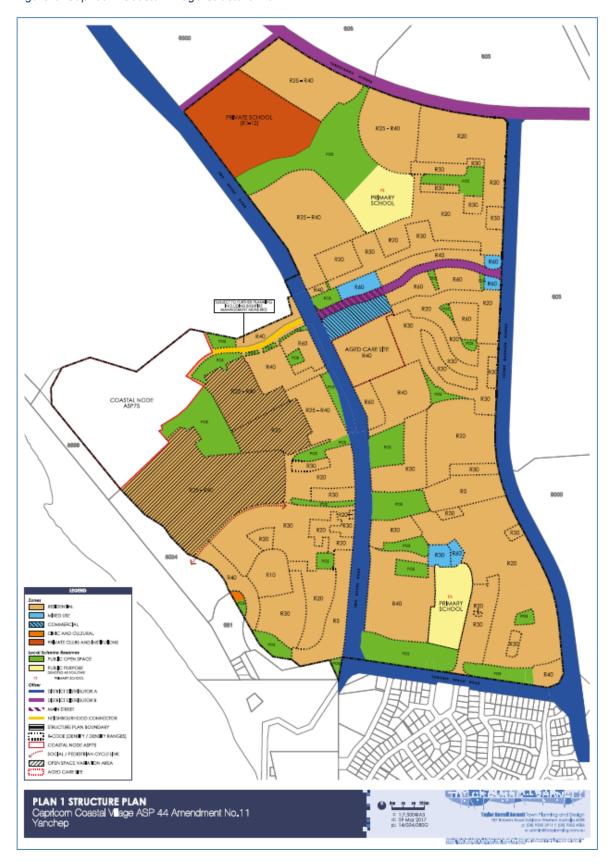
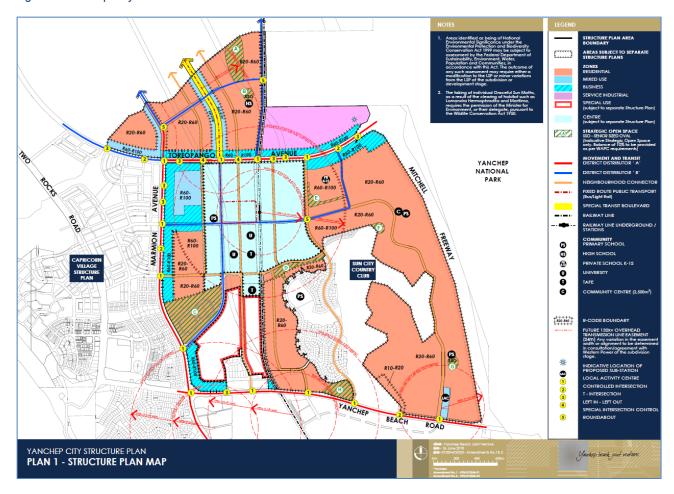


Figure 7 Yanchep City Structure Plan



The road network hierarchy is summarised in Figure 8 and highlights the road hierarchy for the future distributor network within the catchment.

TOREOPANGO AVE

| Internal | Inte

Figure 8. Surrounding Future Road Network

Thresholds for traffic flows and lane configuration set out in the Public Transport Authority (PTA) Station Catchment Mapping Specifications is normally used to determine which sections of the road network that likely will cause barrier effects for pedestrian users and hinder easy crossing opportunities. According to the methodology, a road is classified as a significant barrier and in need of formal crossing facilities depending on lane configuration and traffic volumes.

However, as most roads on the network are yet to be constructed, traffic volumes on these roads are unavailable and are therefore not considered in this assessment. In lack of both observed and modelled data, the assessment assumes that all Primary Distributors and Distributor A roads constitute as pedestrian barriers, while roads further down the hierarchy not are deemed to not significantly hinder pedestrians from crossing. The resulting road barriers are highlighted in Figure 12, with Mitchell Freeway, Marmion Avenue and Toreopango Avenue acting as the main barriers for pedestrian crossing activity (along with the future YRE corridor).

### **Memorandum**

Figure 9. Pedestrian Road Barriers - Future Network



#### 2.2 Pedestrian Network

Figure 11 outlines the current and planned pedestrian provision within the catchment area. Currently, the station catchment is located on a predominately greenfield site. For this analysis, it is assumed that construction may be undertaken in a set of stages. A staging sequence consisting of four interim stages has been suggested as a likely progression of the surrounding development works, before the fully built out scenario is reached.

Suggested staging, along with a representation of the fully built out network, is summarized in Figure 10, and below:

- The first interim stage assumes existing path provision along roads within the catchment area, with no additional upgrades being assumed other than the works included in the construction of the METRONET Yanchep Station. This is likely to be consistent with the road network constructed by the Station opening
- The second interim stage includes extension of Marion Avenue (which is to be renamed in the future), construction of Toreopango Avenue and the construction of Tokyu 3 which serves as with a direct southern connection to the station.
- The third interim stage assumes further delivery of roads within the nearby station area, including Tokyu 4, a direct northern connection to the station.

The full build-out scenario assumes construction of all proposed roads and shared paths as outlined in the Yanchep City Structure Plans (Figure 5 to Figure 7) and the draft City of Wanneroo Local Cycle Network. It is further assumed that all new roads will include footpaths or shared paths on at least one side of the road.

Figure 10: Future Road Network and Interim Stages



Figure 11 summarizes pedestrian accessibility on the future network around the station. Pedestrians are assumed to be able to move along all roads as well as shared paths highlighted in the figure, except for Michell Freeway. Pedestrians are assumed to be able to walk along the designated barriers roads, however formal crossing facilities are deemed necessary for pedestrians to cross them (along with the above-ground sections of the railway). The assumed crossing locations are also highlighted in the figure.

### **Memorandum**

Figure 11: Current and Proposed Pedestrian Provision



#### 2.3 Station Pedestrian Catchment based on Assumed Pedestrian Network

Figure 12 to Figure 15 demonstrates the pedestrian network catchment area within a 10, 15 and 20 minutes-walk from the station assuming an average walk speed of 4.8 kilometres per hour. The catchment analysis includes the pedestrian network upgrades proposed as a part of the overall station development outlined in Section 2.2 under the three interim staging scenarios and the fully built out scenario. Interim stage 1 corresponds to the station opening year and interim stage 3 a potential scenario for 2031, while interim stage 2 reflects a hypothetical scenario as development progresses around the station. The full build out scenario reflects a situation where a fully developed infrastructure is in place to capture as much potential patronage as possible, and is unlikely to occur until the long term (post 2031).

The analysis highlights the importance of the pedestrian network to capture the future Yanchep Station's overall patronage, as well as the opportunity for passengers to access the Station by active modes (rather be solely reliant on car / bus access modes). The focus should be on delivering development and realising the supporting pedestrian network within the immediate surroundings of the station (within an 800m radius), for trips to the station as well as trips from the station to future commercial sites or secondary / tertiary education sites, where the potential to capture pedestrian demand is the greatest. The following priority should be to develop the wider potential pedestrian catchment to fully capture as much pedestrian patronage as possible.

The analysis also demonstrates that the assumed network is unable to adequately serving the existing residential communities in the south-western and south-eastern parts of the potential catchment within a twenty-minute walk. The accessibility is insufficient even for the fully built out scenario, where the south-western and south-eastern residential communities still fall outside the 20-minute catchment. This should be considered to be a significant issue as any existing development provide a vital source of potential patronage, regardless of the progress of any planned development. Construction of additional east-west links providing direct connections to the proposed PSP (including grade separated or controlled rail crossings) should be considered to improve the ease of pedestrian (and cycling) access from existing residential areas, particularly for the first 10 years of the station operating.

Figure 12 Pedestrian Network Catchment for Interim Stage 1 (Opening Year)

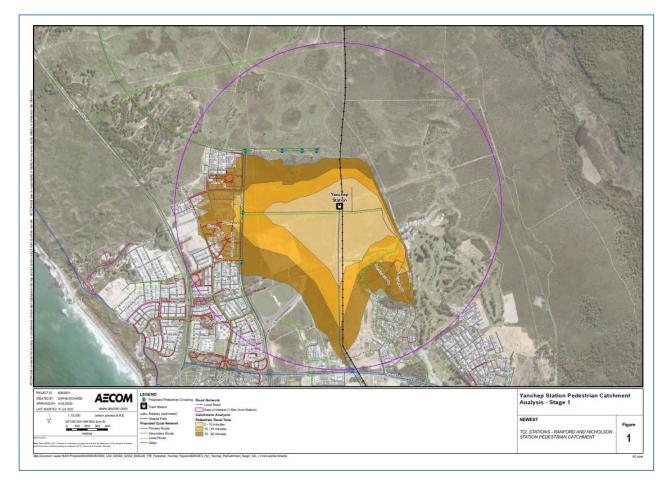


Figure 13 Pedestrian Network Catchment for Interim Stage 2

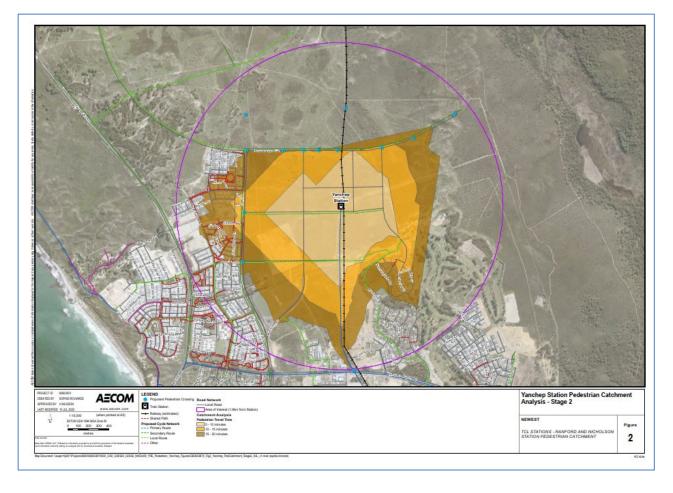
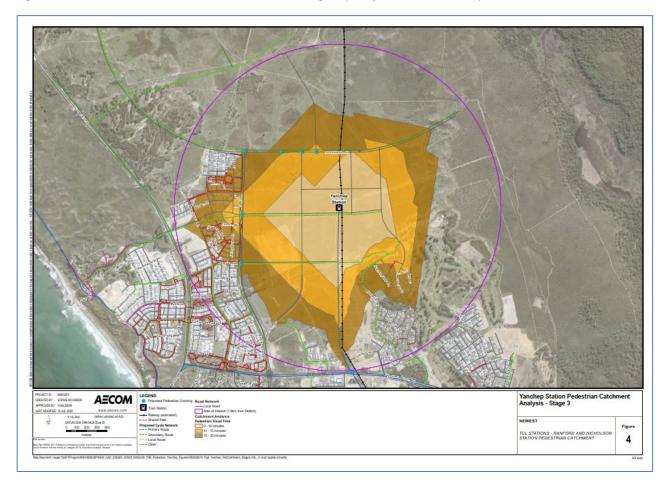
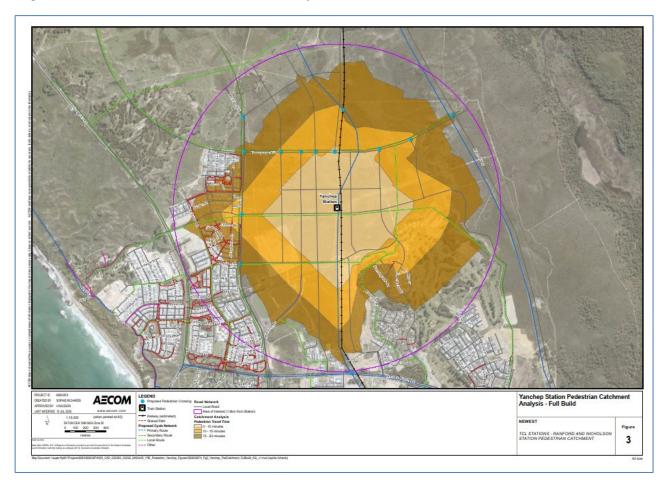


Figure 14 Pedestrian Network Catchment for Interim Stage 3 (Likely Forecast Situation)

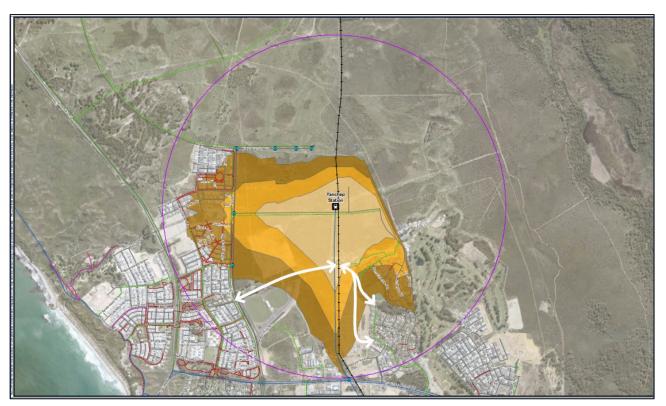


### **Memorandum**

. Figure 15 Pedestrian Network Catchment for the Fully Built Out Scenario



**Memorandum**Figure 16 Pedestrian Network 'Gaps' for Connectivity to Existing Southern Residential Areas



### **Memorandum**

#### 3.0 Conclusions

This note summarises the pedestrian catchment analysis for Yanchep Station. It is estimated that most pedestrian demand will originate from the mixed use, commercial, business, town centre and residential land uses that is planned within the immediate catchment the station (within a ten-minute walk / 800 metre radius). However, residential areas further afield, and other attractors such as secondary schools to the west and business and service industrial areas to the north are also likely to be a major source of pedestrian patronage.

The staging scenario analysis highlights the importance of delivering the supporting infrastructure to realise this potential patronage. Even within the fully built scenario, the network catchment analysis highlights a pedestrian and cycling network gap to connect the existing development areas between the south-west and south-east of the potential catchment and the station. As the network in these areas are characterised of mainly north-south links, accessibility to these areas could be increased by providing diagonal or additional east-west links connecting directly to the proposes PSP, including pedestrian / cycle connections over the rail corridor, as illustrated below in Figure 15. Addressing these connectivity gaps in the interim (by station opening) should be a key focus for Local and State Government, and land development agencies.

Date	09/07/2020
То	Willem du Toit,
	Rob Forbes
From	Hugo Nilsson
	Teresa Matassa
CC	Thor Farnworth, John Caveill, Chris Deshon, Brad Sherlock, Param Lobana,
	Patrick Thompson, Gary Jones, Guy Smith, Martijn Van Het Kaar, Andy Godden
Subject	Yanchep Station Mode Share Review
Doc No.	TCY-DJV-YSC-TM-MMO-0002
Revision	A

#### 1.0 Introduction

NEWest Alliance has been commissioned by METRONET to undertake a review of the catchment analysis for the Yanchep Rail Extension (YRE), based on the most recent land use, infrastructure and station design assumptions. This note summarises the data used and the methodology along with the findings in relation to mode specific patronage and associated parking requirements.

This note considers the existing and forecast land use data and transport network to assess the potential catchments and associated potential patronage for each mode (car, bus, cycle and walk). This is followed by a review of the likely effective mode shares, which, along with the forecast overall patronage volumes, will inform parking requirements.

The analysis in this note builds on previous catchment analysis and transport assessment work carried out for the METRONET YRE project. This work is presented in the below documents, which will be referenced through this note:

- Yanchep Rail Extension Strategic Access Planning (Arup, 2018)
- Yanchep Rail Extension Transport Assessment (WSP, 2019)

Information relating to the assumed future infrastructure network and land use informing the catchment analysis has been gathered from the following City of Wanneroo Structure Plans:

- Capricorn Coastal Node (2015, amended 2017)
- Capricorn Costal Village (2017)
- Lots 1 & 2 Yanchep Beach Road (2007, amended 2019)
- Swan Loc 13460, Yanchep Beach Road (2004)
- Yanchep City (2012, amended 2017)
- Yanchep City Activity Centre (2017)

Overviews of the structure plans are provided Figure 1 to Figure 6.

### **Memorandum**

The exact layout of local roads and walking / cycling routes within these structure plan areas are still under development and therefore the catchment analysis has only been based on mapping of following future key movement corridors:

- Walking and Cycling network:
  - All existing local roads assuming all local roads have a path on at least one side.
  - Existing Primary Distributor, Integrator A and B Roads, Neighbourhood Connector roads matching the existing path provision along these corridors.
  - Future Primary Distributor, Integrator A and B Roads and Neighbourhood Connector roads only assuming these roads will be constructed with walking and cycling facilities as outlined in the Structure Plans.
  - Future Draft Long Term Local Cycle Network primary, secondary and local routes for the City of Wanneroo region.
- Car and Bus network:
  - All existing roads.
  - Future Primary Distributor, Integrator A and B Roads and Neighbourhood Connector roads only.

Figure 1: Capricorn Costal Village Structure Plan



Figure 2:: Capricorn Coastal Node Structure Plan



Figure 3 Lots 1 & 2 Yanchep Beach Road Structure Plan

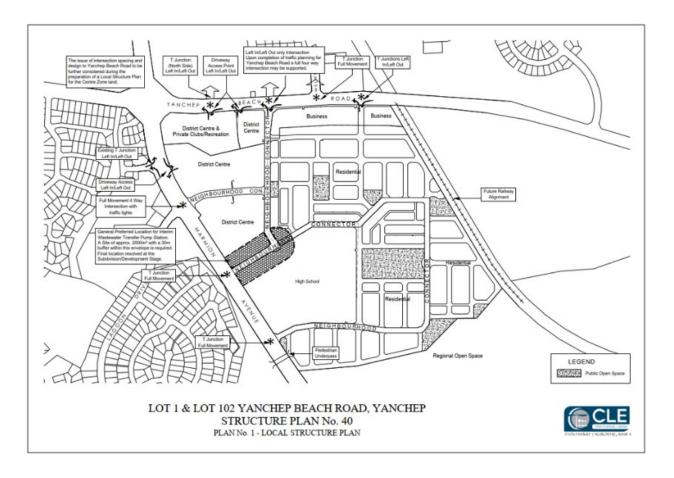


Figure 4: Swan Loc 13460, Yanchep Beach Road Structure Plan



Figure 5: Yanchep City Structure Plan

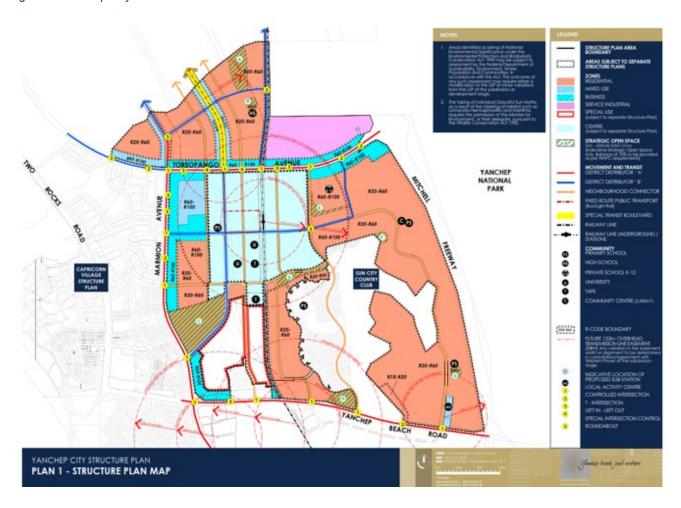
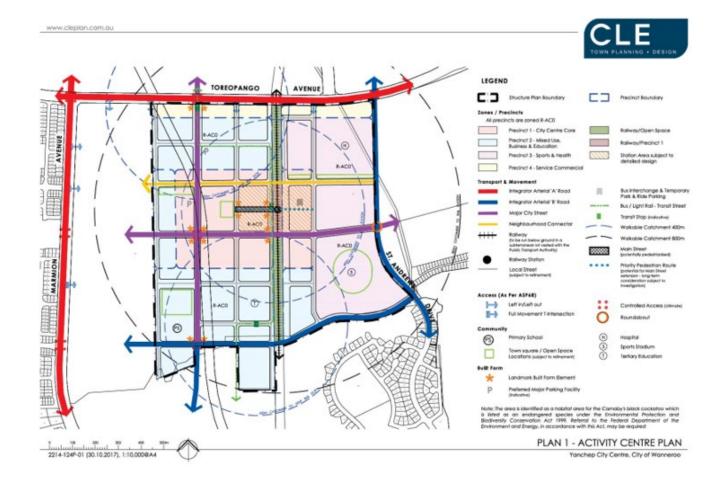


Figure 6: Yanchep City Activity Centre Structure Plan



## 2.0 Geographical Catchment

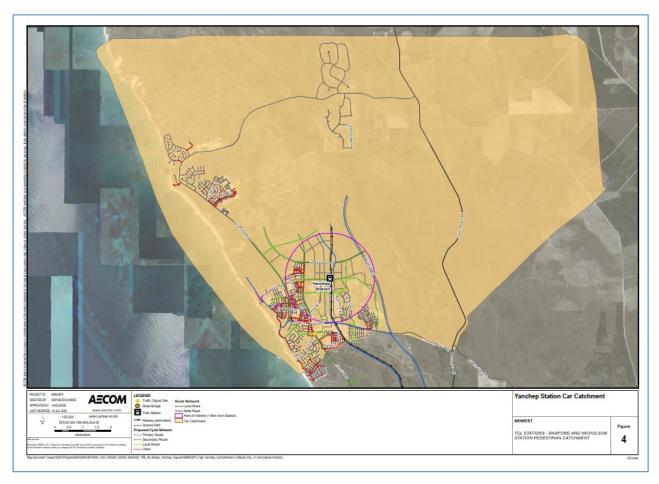
This section describes the methodology of determining the geographical catchments for each mode. The extent of the geographical catchments will subsequently inform the potential patronage capture in Section 4.0.

Land use data from the Metropolitan Land Use Forecasting System (MLUFS) (version 1.6), has been used to estimate the potential population within the future Yanchep Station catchment. MLUFS does not cover areas north of Two Rocks, but this is not considered to be an issue as Two Rocks effectively forms the northern edge of the Perth metropolitan area, with population being very scarce beyond this limit. Therefore, for the purpose of this analysis, Two Rocks will form the northern limit of the whole YRE catchment. Similarly, areas to the east of State Route 60 (Indian Ocean Drive) along most of the YRE is very scarcely populated, although this area is covered in MLUFS and will be included in the assumed catchments.

#### 2.1 General Catchment

The general (car) catchments for all new stations along the YRE was considered within the same analysis using the same assumptions adopted in the YRE Strategic Access Planning (Arup, 2018). This assumes a tendency that drivers will avoid 'back-tracking' and are likely to prefer driving downstream (towards Perth CBD) rather than upstream the railway line. The assumed general catchment for Yanchep Station is presented in Figure 7.

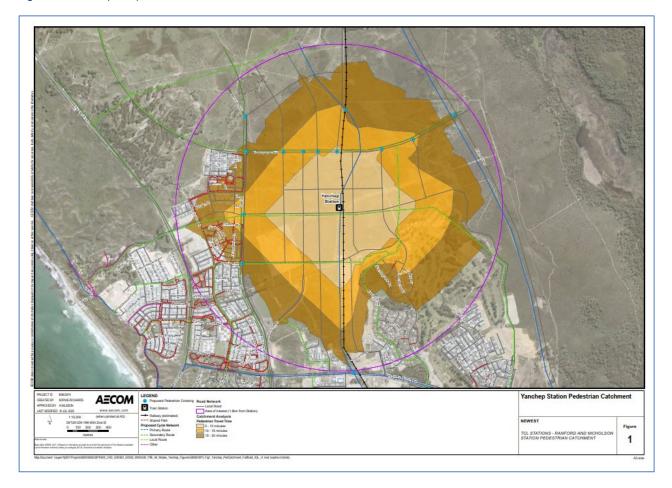
Figure 7: General Catchment



## 2.2 Future (2031) Walkable Catchment

Figure 8 presents the future (2031) walkable catchment around Yanchep Station, segmented into 800m, 1200m and 1600m network distances. This is equivalent to a 10-, 15- and 20-minute walk at 4.8km/h, respectively. The potential walking catchment is set to fall within the 20-minute zone.

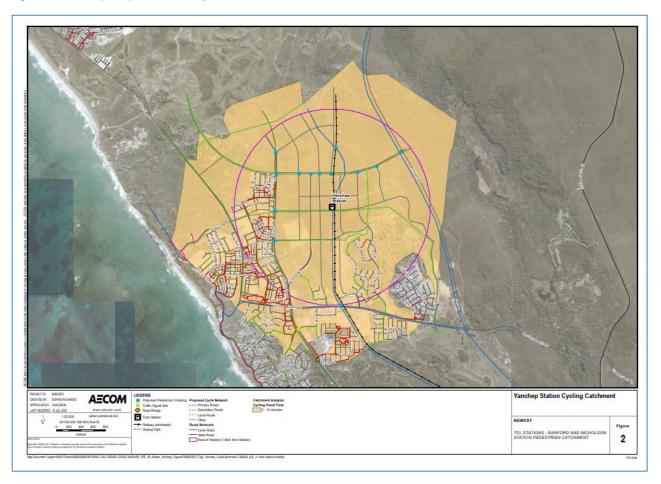
Figure 8: Future (2031) 10 /15/ 20-minute Walkable Catchment



## 2.3 Future (2031) Cyclable Catchment

Figure 9 presents the future cyclable catchment around Yanchep Station, within an 3km network distance. This is equivalent to a 10-minute cycle<sup>1</sup> and is the assumed potential cycling catchment. It further considers the assumed extent of the future cycling catchments of the neighbouring Alkimos Station, using the same principle to avoid 'back-tracking' used to define the general catchment for each individual station.

Figure 9: Future (2031) 10-minute Cyclable Catchment

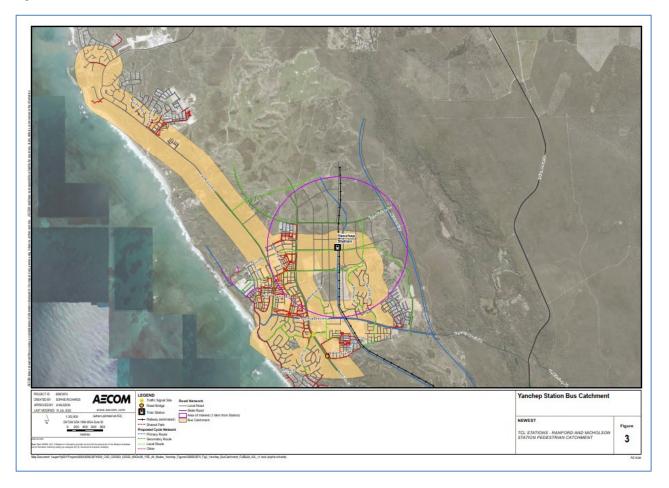


<sup>&</sup>lt;sup>1</sup> Based on an average of 18/km cycle speed

## 2.4 Future (2031) Bus Catchment

A preferred future bus network option has been supplied to the NEWest team by PTA. Figure 10 highlights the resulting associated bus catchment. As route alignment and bus stop locations are yet to be confirmed the catchments are indicative only and formed by a 400m bus route buffer. It further considers the assumed extent of the bus catchments of the neighbouring Alkimos Station, using the same principle to avoid 'back-tracking' used to define the general catchments.

Figure 10: Bus Catchment



#### 3.0 STATION TYPOLOGIES AND PATRONAGE

## 3.1 Yanchep Station Typology

The future Yanchep Station Access Typology and Precinct Typology are identified below in Table 1. The Station Access Typology reflects the anticipated catchment conditions and priority access modes, noting that a Bus n Ride Station suggests a large (typically more than 30 percent) mode share for bus transfers at the station but also allows for similar Park n Ride and walking/cycling mode shares depending on the Precinct typology and surrounding land uses. End of Line stations are strategic stations with large catchments and high expected patronage levels.

Yanchep Station is identified as an SP2 'Strategic Centre' Precinct Typology, which supports a mixed use town centre, including a mixture of residential densities, commercial and retail activity, along with community spaces. Stations with a 'Strategic Centre' Precinct typology are also expected to have a large catchment extending well beyond the station precinct. As a 'Strategic Centre' Precinct, Yanchep Station is anticipated to generate a significant proportion of rail passengers from the immediate walking and cycling catchment once the Town Centre and surrounding land area has been developed, acting as a destination Station as well as generating trips to the Station from the nearby residential areas.

Table 1: Station Typologies

Access Typology	Precinct Typology	Comparable Stations
End of Line / Key Central	SP 2 Strategic Centre	<ul> <li>Butler (End of Line / Suburban)</li> <li>Mandurah (End of Line / Key Central)</li> <li>Midland (End of Line / Key Central)</li> </ul>

#### 3.2 Forecast Patronage

The NEWest adopted patronage forecast for Yanchep Station is presented in Table 1<sup>2</sup>. The forecasts are derived from the STEM multi-modal transport model and are compared below to previous patronage forecasts used in the previous METRONET studies by Arup (2018) and WSP (2019).

Table 2: Forecast Patronage

Year	YRE 2018 <sup>3</sup>	YRE 2019 <sup>4</sup>	YRE Adopted <sup>2</sup>
2021	4,799	1,145	4,799
2031	18,900	15,337	8,616

<sup>&</sup>lt;sup>2</sup> Patronage forecasts specified in the YRE SWTC

<sup>&</sup>lt;sup>3</sup> YRE 2018 - Yanchep Rail Extension Strategic Access Planning (Arup, 2018)

<sup>&</sup>lt;sup>4</sup> YRE 2019 - Yanchep Rail Extension Transport Assessment (WSP, 2019)

## 4.0 Potential Patronage Capture

MLUFS land use data has been used to estimate the potential patronage that can access Yanchep Station by each mode. The analysis for each mode has been carried out to determine the percentage of the MLUFS zones which are within the mode-specific geographical catchment. Detailed information on future land use development gathered from the Structure Plans has been used to further adjust the percentage of the MLUFS zone within a catchment, to more realistically reflect the potential patronage. This adjusts for land uses areas identified within the Structure Plans which are likely to have low residential, employment or education activities such as conservation areas or large sections of public open space.

## 4.1 MLUFS Data

MLUFS data describe forecasted population and employment figures for the Perth metropolitan region and forms the basis for the catchment analysis. The zones falling within the station catchments are highlighted in Figure 11.

Figure 11: MLUFS Zones

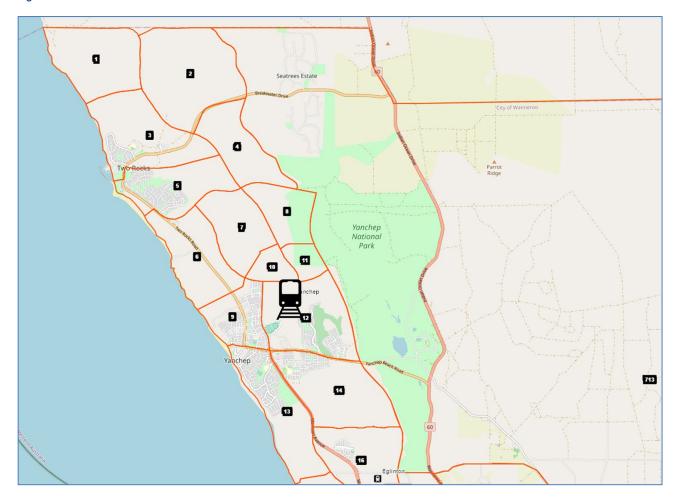


Table 3 provides a break-down of the residential and employment data for each zone for the year 2021 and 2031, along with the resulting growth between the two years. The zones with the higher proportion of existing or future population are highlighted in shades of green, illustrating the zones which have the potential to generate the most trips for Yanchep Station in 2021 and 2031. These zones should therefore be a key focus for delivery of the interim (2021) and future transport routes to the station.

Table 3: MLUFS Land Use Data

		2021		2031			2021 to 2031
MLUFS Zone	Residents	Employment	Total	Residents	Employment	Total	Growth
1	0	6	6	173	2,006	2,179	36217%
2	0	12	12	274	3,630	3,904	32433%
3	1,221	622	1,843	3,342	3,702	7,044	282%
4	0	6	6	173	2,528	2,701	44917%
5	3,617	112	3,729	9,408	2,009	11,417	206%
6	64	28	92	837	2,539	3,376	3570%
7	0	162	162	176	2,642	2,818	1640%
8	0	102	102	2	286	288	182%
9	3,390	951	4,341	6,369	1,816	8,185	89%
10	0	322	322	43	1,625	1,668	418%
11	92	0	92	353	182	535	482%
12	5,487	702	6,189	24,244	3,764	28,008	353%
13	5,230	701	5,931	10,007	965	10,972	85%
14	3,080	578	3,658	6,597	903	7,500	105%
713	868	426	1,294	869	445	1,314	2%

## 4.2 Overall Catchment Potential

Figure 12 provides an overview of the area overlap between the general catchment and the MLUFS zones, along with detailed land use data. The overlap provides an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential car patronage for Yanchep Station.

Figure 12: Future (2031) Overall Catchment, Land Use and MLUFS Zone Overlap

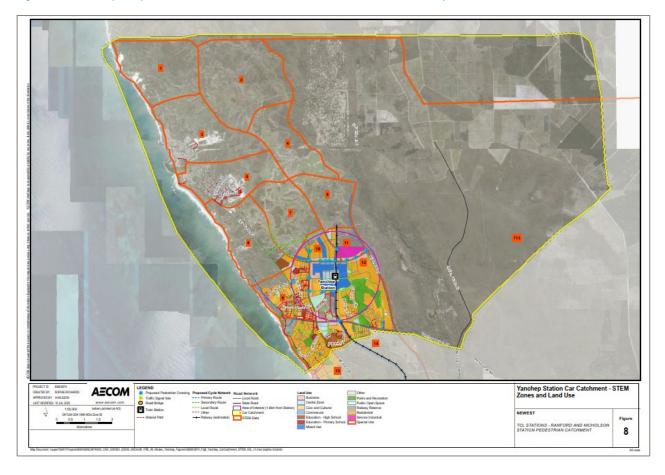


Table 4 highlights the proportion of each MLUFS zone captured within the overall station catchment, along with any adjustment made to the overlap percentage following consideration of the existing and planned detailed land use data sourced from Structure Plans.

Table 4: Future (2031) Overall Catchment and MLUFS Zone Adjusted Overlap

	Car - 2031						
MLUF S Zone	Overlap	Adjusted overlap	Reason for adjustment				
1	100%	100%					
2	100%	100%					
3	100%	100%					
4	100%	100%					
5	100%	100%					
6	100%	100%					
7	100%	100%					
8	100%	100%					
9	100%	100%					
10	100%	100%					
11	100%	100%					
12	100%	100%					
13	37%	60%	Most non-developable land falls outside catchment				
14	21%	100%	All patronage-generating land use falls inside catchment				
713	22%	100%	All patronage-generating land use falls inside catchment				

## 4.3 Future (2031) Bus Catchment Potential

Figure 13 provides an overview of the area overlap between the bus catchment and the MLUFS zones, along with detailed land use data. The overlap provides an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential bus patronage for Yanchep Station.

Figure 13: Future (2031) Bus Catchment, Land Use and MLUFS Zone Overlap

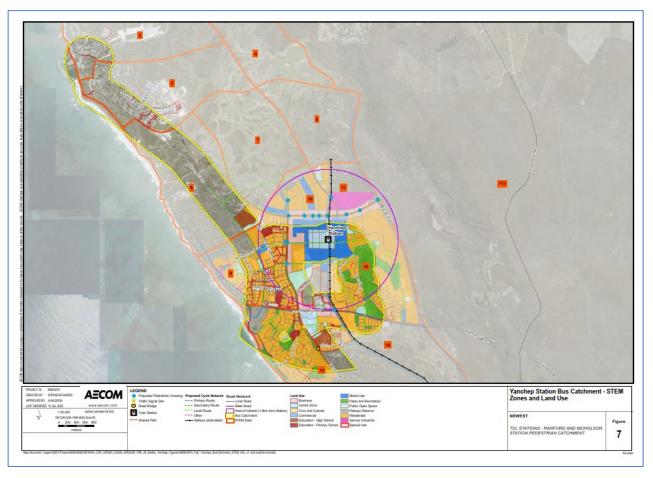


Table 5 provides an overview of the area-based overlaps between the bus catchment and the MLUFS zones, along with any adjustment made to the overlap percentage following consideration of the existing and planned detailed land use data sourced from structure plans.

Table 5: Future (2031) Bus Catchment and MLUFS Zone Adjusted Overlap

			Bus - 2031
MLUF S Zone	Overlap	Adjusted overlap	Reason for adjustment
3	10%	50%	Catchment extends to roughly half of the Two Rocks built up area within Zone 3
5	28%	50%	Catchment extends to roughly half of the Two Rocks built up area within Zone 5
6	53%	50%	Catchment extends to roughly half of the Two Rocks built up area within Zone 6
9	66%	75%	Most of non-developable land in Zone 9 falls outside catchment
12	53%	53%	
13	32%	40%	Most non-developable land falls outside catchment
14	18%	90%	All non-developable land use falls outside catchment

## 4.4 Future (2031) Cycling Catchment Potential

Figure 14 provides an overview of the area overlap between the cyclable catchment and the MLUFS zones, along with detailed land use data. The overlap provides an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential cycle patronage for Yanchep Station.

Figure 14: Future (2031) Cyclable Catchment, Land Use and MLUFS Zone Overlap

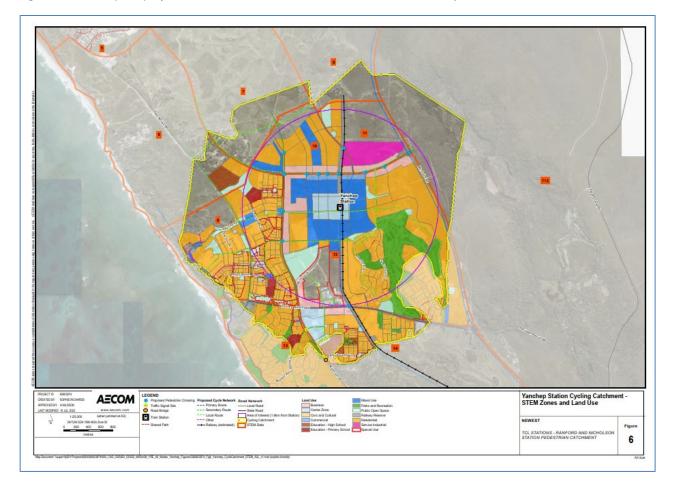


Table 6 highlights the area-based overlaps between the cyclable catchment and the MLUFS zones, along with any adjustment made to the overlap percentage following consideration of the existing and planned detailed land use data sourced from structure plans.

Table 6: Future (2031) Cyclable Catchment and MLUFS Zone Adjusted Overlap

			Cycling - 2031
MLUF S Zone	Overlap	Adjuste d overlap	Reason for adjustment
6	14%	100%	All patronage-generating land use falls inside catchment
7	22%	22%	
8	15%	15%	
9	89%	100%	All patronage-generating land use falls inside catchment
10	100%	100%	
11	100%	100%	
12	85%	85%	
13	9%	20%	Most non-developable land falls outside catchment
14	17%	100%	All patronage-generating land use falls inside catchment

## 4.5 Future (2031) Walking Catchment Potential

Figure 15 provides an overview of the area overlap between the walkable catchment and the MLUFS zones, along with detailed land use data. The overlap provides an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential pedestrian patronage for Yanchep Station.

Figure 15: Future (2031) Walkable Catchment, Land Use and MLUFS Zone Overlap

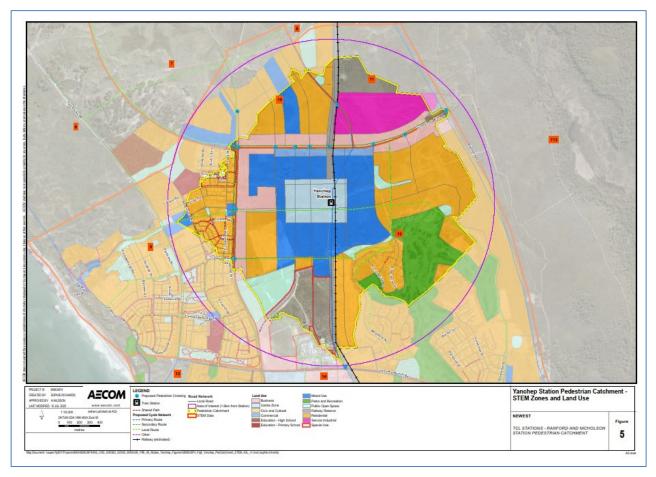


Table 7 highlights the area-based overlaps between the future walkable catchment and the MLUFS zones, along with any adjustment made to the overlap percentage following consideration of the existing and planned detailed land use data sourced from structure plans.

Table 7: Future (2031) Walkable Catchment and MLUFS Zone Adjusted Overlap

	Walking - 2031						
MLUF S Zone	Overlap	Adjusted overlap	Reason for adjustment				
9	11%	15%	Most of non-developable land in Zone 9 falls outside catchment				
10	42%	50%	All non-developable land use falls outside catchment				
11	49%	49%					
12	57%	70%	The most vital sources of patronage (mixed use, commercial and high-density residential land use) falls within catchment				

## 4.6 Mode Share Potential

Table 8 summarizes the adjusted overlaps between the mode-specific catchments and the MLUFS zones, along with the resulting potential patronage volumes based on the adopted YRE Station forecasts presented in Section 3.0. It is important to note that these potential patronage volumes only denote the theoretical maximum patronage volumes for each mode.

Table 8: Potential Patronage by Mode

Adjusted overlap - 2031						Potential patronage - 2031				
MLUFS Zone	Car	Bus	Cycling	Walking	Car	Bus	Cycling	Walking		
1	100%	0%	0%	0%	173	0	0	0		
2	100%	0%	0%	0%	274	0	0	0		
3	100%	50%	0%	0%	3,342	3,522	0	0		
4	100%	0%	0%	0%	173	0	0	0		
5	100%	50%	0%	0%	9,408	5,709	0	0		
6	100%	50%	100%	0%	837	1,688	3,376	0		
7	100%	0%	22%	0%	176	0	620	0		
8	100%	0%	15%	0%	2	0	43	0		
9	100%	75%	100%	15%	6,369	6,139	8,185	1,228		
10	100%	0%	100%	50%	43	0	1,668	834		
11	100%	0%	100%	49%	353	0	535	262		
12	100%	53%	85%	70%	24,244	14,844	23,807	19,606		
13	60%	40%	20%	0%	6,004	4,389	2,194	0		
14	100%	90%	100%	0%	6,597	6,750	7,500	0		
713	100%	0%	0%	0%	869	0	0	0		

The combined potential patronage volumes for all MLUFS zones and each mode serve as the basis for the upper limits of the mode shares. This is done by calculating the proportion of potential patronage for each mode relative to the potential car patronage, as summarised in Table 9.

Table 9: Potential 2031 Mode Shares

2031	Car	Bus	Cycling	Walking
Potential patronage	58,864	43,040	47,928	21,930
Potential mode share	100%	73%	81%	37%
Potential mode share (Arup, 2018)	100%			12%

#### 5.0 Access Mode Share

The effective mode shares for 2031, presented in Table 10, have been derived using bench-marking analysis against similar stations (considering the Station typologies and catchment conditions) and consideration of the potential mode shares derived in Section 4.0. These have subsequentially been compared to the mode shares suggested by previous YRE 2018<sup>3</sup> analysis (Arup) and YRE 2019<sup>4</sup> analysis (WSP). The car access modes, 'Kiss and Ride' (KnR) and 'Park and Ride' (PnR) has been estimated separately, in order to be able to assess the required parking supply in Section 6.0.

It should be noted that the Arup analysis assumed a future year of 2051 and subsequentially has a more optimistic target for active mode shares. The WSP analysis, which builds on the Arup analysis, is based on 2021 mode shares, but assumed fully built out and utilised parking infrastructure at the station. Therefore, the WSP mode shares could potentially underestimate the active mode share targets for a 2031 scenario.

Table 10: Effective Mode Shares 2031

Mode shares	YRE 2018 <sup>5</sup>	YRE 2019 <sup>6</sup>	STEM	YRE 2020 Catchment Analysis	Comments
Walkin g	10%	7%		25%	Based on the large potential pedestrian patronage for Yanchep Station, and benchmarking against Butler Station (34%) and Midland Station (17%) existing mode shares. It is anticipated that development in the next 10 years will focus in the Yanchep Town Centre area closest to the station, and therefore reasonable to assume a larger walking mode share by 2031, than the previous YRE estimates.
Cycling	20%	5%		5%	Based on very large potential cycling patronage for Yanchep Station, and benchmarking against Butler Station (3%), Mandurah Station (3%) and Midland Station (3%) target 2031 mode shares. A more ambitious mode share compared to the benchmarked stations is proposed as the development of Yanchep City Activity Centre will provide a higher degree of accessibility for active modes.
Walkin g + Cycling	30%	12%	42%	30%	The overall active mode share reflects a conservative assumption compared to existing walking and cycling mode shares for Butler Station and the potential catchments for Yanchep, and anticipating that development in the next 10 years will focus on Yanchep City Activity Centre precinct closer to the Station.
Bus	38%	46%	28%	30%	Based on a large potential bus patronage for Yanchep Station, and benchmarking against Butler Station (23%), Mandurah Station (41%) and Midland Station (28%) existing bus mode shares – taking a mid-range mode share suitable for a Bus n Ride / End of Line typology.
KnR	22%	14%	2%	15%	Based on benchmarking against existing Butler Station Kiss n Ride mode share.
PnR	10%	28%	28%	25%	Remaining mode share, and comparable to Butler Station (27%) existing mode share and Mandurah Station (25%) and Midland Station (29%) target future modes shares. There is opportunity for a reduced Park n Ride mode share if active transport modes are strongly encouraged.

A formalised assessment of effective modes shares for the year 2021 has not been undertaken owning to the uncertainty of the completion of the development surrounding the station. It is likely that much of the development supporting active station access modes will not be in place by 2021. Therefore, a larger proportion of the mode shares are likely to consist of car and bus modes. An indicative assessment of the mode shares for 2021 is presented in Table 10 and includes a comparison with previous Arup and WSP analysis.

<sup>&</sup>lt;sup>5</sup> YRE 2018 - Yanchep Rail Extension Strategic Access Planning (Arup, 2018)

<sup>&</sup>lt;sup>6</sup> YRE 2019 - Yanchep Rail Extension Transport Assessment (WSP, 2019)

A formalised assessment of effective modes shares for the year 2021 has not been undertaken owning to the uncertainty of the completion of the development surrounding the station. It is likely that much of the development supporting active station access modes will not be in place by 2021. Therefore, a larger proportion of the mode shares are likely to consist of car and bus modes. An indicative assessment of the mode shares for 2021 is presented in Table 10 and includes a comparison with previous Arup and WSP analysis.

Table 11: Effective Mode Shares 2021

				2021
Mode shares	YRE 2018 <sup>7</sup>	YRE 2019 <sup>8</sup>	YRE 2020 Catchment Analysis	Comments
Walking	2%	7%	7%	A conservative estimate to reflect the low likelihood of nearby development being completed at opening, and therefore less than half of the anticipated walking mode share by 2031 (but recognising existing development areas to the east and west of the Station should be directly connected the at the station through east-westerly links at station opening and therefore within the walkable catchment).
Cycling	10%	5%	5%	A conservative estimate to reflect the low likelihood of nearby development being completed at opening, and reflecting existing cycling mode shares along the Joondalup Line.
Walking + Cycling	12%	12%	12%	A conservative estimate is suggested to reflect the low likelihood of nearby development and extensive supporting infrastructure for active modes being completed at opening
Bus	12%	46%	35%	A more conservative estimate than the previous WSP bus mode share to reflect a reduced bus network being in place at opening, but still reflecting the intention for Yanchep to be an End of Line / Bus n Ride Station Access Typology with the proposed bus routes focused on existing residential areas.
KnR	30%	14%	20%	Assuming a greater proportion of passengers will originate from outside the walking and cycling catchment due to limited development in Yanchep City Activity Centre being completed by the Station opening.
PnR	46%	28%	33%	Remaining mode share; if unlimited parking is provided.

<sup>&</sup>lt;sup>7</sup> YRE 2018 - Yanchep Rail Extension Strategic Access Planning (Arup, 2018)

<sup>&</sup>lt;sup>8</sup> YRE 2019 - Yanchep Rail Extension Transport Assessment (WSP, 2019)

Table 12 presents the resulting patronage volumes for each mode for the years 2021 and 2031.

Table 12: Patronage by Mode

Patronage by mode	2021	2031
Walking	336	2,154
Cycling	240	431
Bus	1,680	2,585
KnR	960	1,292
PnR	1,584	2,154

#### 6.0 Station Requirements

Based on the PnR patronage volumes estimated in Section 5.0, long-term parking supply requirements for Yanchep Station has been assessed, using an assumed 1.1 parking space turnover rate and 1.2 vehicle occupancy rate (comparable to the assumptions used in the previous Arup and WSP analysis). The resulting necessary parking supply is presented in Table 13, along with a comparison against previous YRE analysis, STEM modelling assumptions and current design provision.

The analysis suggests that the current design provision is less than required for the estimated parking demand for both 2021 and 2031. However, this is based on the current forecast patronage to be reached at these time periods, whereas it may be likely that daily boardings and subsequent parking demand is less than currently forecast due to slower population growth. In addition, there is an opportunity to recognise this potential parking capacity issue and focus on prioritising the construction of new walking/cycling connections, along with high frequency bus services, as part alongside of the delivery of the new Station.

Table 13: Future (2031) Parking Requirements

Parking	YRE 2018 <sup>5</sup>	YRE 2019 <sup>6</sup>	STEM	Current 15% Design	YRE 2020 Catchment Analysis
2021	479	1,023		971	1,200
2031	1,394	1,023	1,000	971	1,632

#### 7.0 Conclusions

This note has reviewed the future catchment and proposed station access mode shares for Yanchep Station. The analysis provides a conservative forecast of future access mode shares for Yanchep Station, based on more limited construction of new paths and roads to the station by the time of opening, and a 'business as usual' approach to marketing and providing for active transport access to the station. Based on this analysis, the proposed level of parking provision is insufficient for the estimated demand for both the 2021 and 2031 forecast years. This will likely lead to loss of potential rail patronage unless measures are put in place to encourage a more extensive uptake in bus and active modes, including marketing of these modes (including promotion of personal health benefits and fast trip time to the future station). Alternatively, options to increase parking provision should be considered, if monitoring of the patronage and parking demand at the station opening and following it continues to grow towards the forecast 2031 demand.

## TRANSPORT IMPACT ASSESSMENT **APPENDIX I**

# Yanchep Station: Transport Impact Assessment

METRONET Stage 1 Initiatives: Yanchep Railway Extension and Thornlie-Cockburn Link

#### **Document Approval**

Rev	Date	Prepared by	Reviewed By	Approved by
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# DETAILS OF REVISION AMENDMENTS AND PLAN TERMINOLOGY

#### **Document Control**

The Transport Engineer is responsible for updating this plan to reflect changes as required.

#### **Amendments**

Any revisions or amendments must be approved by the Transport Engineer and/or NEWest before being distributed or implemented.

#### **Revision Details**

Revision	Details
A	Issued for 15% Design

#### **Terms and Definitions**

Term	Meaning			
DoS – Degree of Saturation	The DoS is a measure of available capacity at a road intersection, and is the ratio of the demand to capacity. The reported figure is this report reflects the maximum forecast DoS at the intersection:			
	- A DoS less than 90 percent indicates that a vehicle movement / intersection is able to operate within the practical capacity, and is less likely to experience significant movement delays.			
	- A DoS over 90 percent indicates a vehicle movement / intersection has exceeded practical capacity and is more likely to experience some delay or congestion, with mitigation measures likely to be required to ensure adequate capacity for priority movements at peak periods.			
	<ul> <li>A DoS of 100 percent or more indicates an intersection has exceeded practical capacity which would likely result in delay for vehicle movements, and be generally considered an undesirable outcome.</li> </ul>			
LoS – Level of Service	The LoS is a measure of the forecast delay for vehicle movements at a road intersection. The LoS measure ranges from A to F, and provides an indicator of the performance of the network or individual movement based on the average delay per passenger car unit (pcu).			
	For the YRE Station Accesses:			
	<ul> <li>LoS D is considered acceptable at peak times.</li> <li>LoS E or F for a priority movement reflects unacceptable delay and /or queuing at an intersection. For minor movements, this may be acceptable if queuing does not result in safety issues or impact other movements.</li> </ul>			
Aimsun	Transport network modelling software.			
SIDRA	Intersection analysis software used to analysis intersection performance.			

## **Abbreviations and Acronyms**

Abbreviation/Acronym	Definition
DoS	Degree of Saturation
LoS	Level of Service
PSP	Principle Shared Path
PTA	Public Transport Authority
ROM24	Regional Operations Model version 24– Main Roads strategic transport network model used for forecast road demand
WAPC	Western Australian Planning Commission
YRE	Yanchep Rail Extension

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## 1.0 INTRODUCTION AND BACKGROUND

#### 1.1 METRONET YANCHEP RAIL EXTENSION BACKGROUND

The proposed Yanchep Station forms part of the wider METRONET Yanchep Rail Extension (YRE) project to deliver an extension of the existing rail line, north of the current terminus station at Butler. The project aims to deliver a 14.5km rail extension between Butler and Yanchep to support the ongoing growth in the region and alleviate traffic congestion along key routes by providing a wider reaching public transport service to the outer regions of Perth.

The YRE project is to be delivered by the NEWest Alliance, on behalf of the Public Transport Authority (PTA).

Yanchep has been identified as an emerging Strategic Metropolitan Centre by State Planning Policy 4.2 – Activity Centres for Perth and Peel (2010), the Yanchep Two-Rocks District Structure Plan (2010) and the Yanchep City Local Structure Plan No. 68 (2011). The City Centre will provide the economic core for the region accommodating a projected working population of 23,500 by the year 2031.

The primary components of the YRE project include the construction of three new train stations at the key locations of Alkimos, Eglinton and Yanchep. Each of the proposed new train stations will also include a bus station for public transport connectivity, Park & Ride, Kiss & Ride plus infrastructure for active modes.

YANCHER STATION PROPOSED STATION EXISTING STATION Wanneroo EXISTING TRACK ···· PROPOSED TRACK Yanchep Beach Rd Yanchep Wanneroo Yanchep **EGLINTON** STATION Eglinton ALKIMO: Pinjar STATION Alkimos Butler **BUTLER** STATION Nowergup

Figure 1. YRE Project Overview

Source: METRONET

#### 1.2 PROPOSED YANCHEP STATION BACKGROUND

The proposed Yanchep Station is located at the end of the future YRE, approximately 57 kilometres north of Perth. The proposed station site is to be located in the north-eastern portion of the current Yanchep town centre. The area surrounding the station site is currently undeveloped, however future development in the vicinity of the station is expected to result as the station infrastructure is established and the Yanchep area grows in population.

Yanchep Station will be the final station along the YRE and will allow for public transport access from the emerging Strategic Metropolitan Centre of Yanchep and surrounding areas, to the Joondalup Rail line and broader Perth passenger rail network.

## 1.3 PURPOSE OF THIS DOCUMENT

This Transport Impact Assessment (TIA) has been prepared to support the ongoing development application of the proposed Yanchep Station and seeks to outline the existing and proposed transport elements associated with the train station, due to be constructed as part of the wider METRONET YRE project.

As per the Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines for Individual Developments (Volume 4), it is anticipated that the station will generate in excess of 100 vehicle trips within the development peak hour – resulting in what is considered to be a 'high' level of impact. Therefore, a transport impact assessment level of investigation is deemed to be appropriate for this development.

As such, this document has been prepared in accordance with the framework established within the WAPC guidelines.

## 2.0 EXISTING SITUATION

## 2.1 PROJECT SITE

The site of the proposed Yanchep Station is located approximately 2km north-east of the existing intersection of Marmion Avenue and Yanchep Beach Road. This roundabout is expected to serve as one of the primary connections to the station from the surrounding road network once the extension of Marmion Avenue to the north is completed as part of the local connectivity improvements and wider station access works.

The proposed station is to be located on a currently unoccupied greenfield parcel of land. The approximate site boundary is shown in Figure 2.





Source: Google Maps

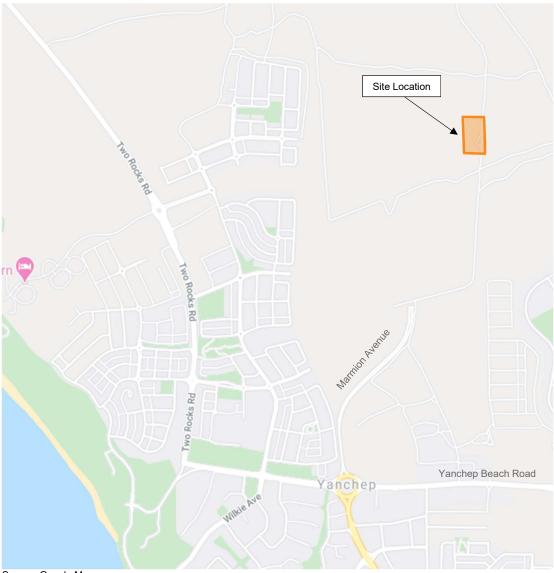
As the site is currently unoccupied, there are no existing land uses or traffic generation associated with site usage in or adjacent to the proposed Yanchep Station boundary.

## 2.2 SURROUNDING ROAD NETWORK

#### 2.2.1 LOCAL ROAD NETWORK

The road network in the area surrounding the proposed Yanchep Station site is shown in Figure 3.

Figure 3. Yanchep Station Surrounding Road Network



Source: Google Maps

As can be seen from the above road network, the Yanchep Station site location does not currently have direct connection to the existing road network. As this area of Yanchep is not fully developed, road connectivity in this region is only partially complete at the present time.

However, it is understood that as part of the station development works, road network connectivity will be provided to the site area via a planned extension of Marmion Avenue. The proposed road network modifications and how they integrate with the Yanchep Station accesses are discussed in further detail as part of the Development Proposal (Section 3.0).

Yanchep Beach Road is the current major east-west link within the Yanchep area that is expected to support the movement of passengers to the station from the existing residential communities to along the coastline, and any future residential expansions that are likely to occur to the east. The road is a single carriageway (no median), two-way road with sealed shoulders along the majority of its length. Currently, the speed limit along the road is limited to 60 km/h in the built-up sections of the surrounding area. The speed limit increases to 80 km/h to the east as the environment becomes more rural. Yanchep Beach Road also provides connectivity to other key distributor roads in the area including Two Rocks Road and Marmion Avenue.

Marmion Avenue is one of the key north-south connections within Yanchep that provides regional vehicle access along the coastline and supports connectivity to several expansive residential housing areas. While Marmion Avenue currently terminates approximately 1 kilometre north of the Yanchep Beach Road and Marmion Avenue roundabout, this segment of road is to be extended as part of the associated station roadworks.

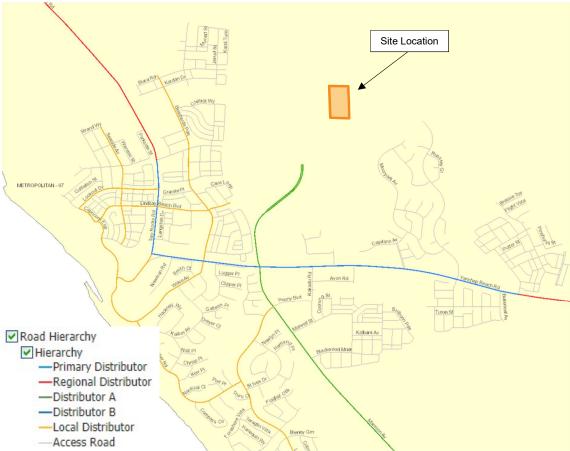
South of Yanchep Beach Road, Marmion Avenue is currently a one lane per direction single carriageway with a speed limit of 60 km/h. However, the City of Wanneroo is currently undertaking construction (with expected completion in early 2020) of a dual carriageway upgrade along Marmion Avenue between Reflection Boulevard in Brighton, through to Yanchep Beach Road. Therefore, the section of road south of the station location is currently being upgraded to a two-lane per direction dual carriageway (with median).

Lastly, Two Rocks Road provides further regional connectivity to the north and connects the community at Two Rocks to the town of Yanchep. This route is likely to be a key link in the future following the completion of the proposed Yanchep Station as improved public transport options are opened up to residents of Two Rocks. The road is a one lane per direction single carriageway with a speed limit of 60 km/h in residential areas, increasing to 90 km/h further north outside of Yanchep.

#### 2.2.2 MAIN ROADS WA ROAD HIERARCHY

The road hierarchy system of the surrounding network, as per the Main Roads WA Road Information Mapping System, is shown in Figure 4.

Figure 4. Local Road Hierarchy



Source: Main Roads WA Road Information Mapping System (https://mrwebapps.mainroads.wa.gov.au/publicmaps/rim)

As per the above functional road hierarchy in the vicinity of the proposed site location, it can be seen that Marmion Avenue is classified as a District Distributor A, indicating that this route is managed by the local government, City of Wanneroo.

Yanchep Beach Road is classified as a District Distributor B and is also managed by the City of Wanneroo.

Finally, Two Rocks Road is classified as Regional Distributor and is therefore also managed by the City of Wanneroo.

### 2.2.3 EXISTING TRAFFIC FLOW INFORMATION

#### 2.2.3.1 Marmion Avenue

Traffic data along Marmion Avenue at the intersection of Lagoon Drive (south of the Yanchep Beach Road roundabout) has been sourced from the Main Roads WA Traffic Map.

The data was recorded via the permanent traffic signals at the Lagoon Drive intersection over a one week period between 18 November 2019 and 24 November 2019. Given that traffic signal detectors are unable to distinguish light vehicles and heavy vehicles, it is assumed that the vehicle split at this location is 95% light vehicles and 5% heavy vehicles. This was found to be consistent with the observed MRWA Traffic Map information at other nearby detector sites along Marmion Avenue in the region.

The recorded AM and PM peak period traffic counts for Marmion Avenue are summarised in Table 1 and Table 2, respectively.

Table 1. Marmion Avenue 2019 AM Peak Counts

Marmion Avenue	2019 AM Peak (08:00 - 09:00)					
Walling Avenue	Northbound	Southbound				
Light Vehicles	332 568					
Heavy Vehicles	18	30				
Total	350	598				

Table 2. Marmion Avenue 2019 PM Peak Counts

Mayorian Avenue	2019 AM Peak (15:00 – 16:00)					
Marmion Avenue	Northbound	Southbound				
Light Vehicles	454	454				
Heavy Vehicles	24	24				
Total	478	478				

#### 2.2.3.2 Yanchep Beach Road

Existing traffic data along Yanchep Beach Road is limited to a single detector site located west of the Wanneroo Road intersection, approximately 4.5 kilometres east of the centre of Yanchep. Latest data available for this segment of Yanchep Beach Road is from the 2017/18 period and has been sourced from the Main Roads WA Traffic Map.

The recorded AM and PM peak period traffic counts for Yanchep Beach Road are summarised in Table 3 and Table 4, respectively.

Table 3. Yanchep Beach Road 2017/18 AM Peak Counts

Vanahan Basah Basal	2017/18 AM Peak (07:00 - 08:00)					
Yanchep Beach Road	Eastbound	Westbound				
Light Vehicles	267	102				
Heavy Vehicles	vy Vehicles 17					
Total	284	118				

Table 4. Yanchep Beach Road 2017/18 PM Peak Counts

Vanahan Basah Basal	2017/18 AM Peak (16:00 - 17:00)					
Yanchep Beach Road	Eastbound	Westbound				
Light Vehicles	129	318				
Heavy Vehicles	12	19				
Total	141	337				

#### 2.2.3.3 Two Rocks Road

Traffic data for Two Rocks Road was also sourced from the Main Roads WA Traffic Map. Information was obtained from the detector located approximately 200 metres north of the Yanchep Beach Road intersection for the 2017/18 period.

The recorded AM and PM peak period traffic counts for Two Rocks Road are summarised in Table 5 and Table 6, respectively.

Table 5. Two Rocks Road 2017/18 AM Peak Counts

Two Rocks Road	2017/18 AM Peak (08:00 - 09:00)					
TWO ROCKS ROAU	Northbound	Southbound				
Light Vehicles	204	315				
Heavy Vehicles	16	28				
Total	220	343				

Table 6. Wanneroo Road 2017/18 PM Peak Counts

Two Books Book	2017/18 AM Peak (15:00 – 16:00)					
Two Rocks Road	Northbound	Southbound				
Light Vehicles	296	242				
Heavy Vehicles	25	13				
Total	321	255				

## 2.3 EXISTING BUS ROUTES

Current Transperth bus route information for the area surrounding the Yanchep Station site has been sourced from Transperth timetables and network mapping.

The bus routes which currently operate in the vicinity are shown in Figure 5.

Figure 5. Existing Transperth Bus Route Map



Source: Transperth Network Maps (https://www.transperth.wa.gov.au/journey-planner/network-maps)

From the Transperth network map, there are presently two bus routes which travel through Yanchep. Route 490 passes through Yanchep and connects to Two Rocks in the north, while Route 491 connects Yanchep to Butler and provides bus connectivity throughout Yanchep. Currently, neither of these bus routes accesses north of Marmion Avenue where the future Yanchep Station access is expected to be located.

### 2.4 EXISTING PEDESTRIAN AND CYCLING NETWORK

The vicinity of the proposed Yanchep Station is not currently covered by the Department of Transport Joondalup and Stirling bike map, as this presently extends only as far as Butler. However, the City of Wanneroo has prepared a key bike routes map for the project area, as shown in Figure 6.

In addition, satellite maps indicate that Yanchep Beach Road currently provides a 2.0-3.0 metre wide shared path on the southern side of the roadway, east of the Marmion Avenue intersection. West of the Marmion Avenue intersection, Yanchep Beach Road provides no pedestrian or cycle path, and there are currently no sealed shoulders suitable for on-street cycling.

VANNEROO. CZY OF Yanchep INDIAN Legend Missing Links Identified by DoT Key Corridor Missing Links Identified by Jacobs --- New High Quality Shared Path: **OCEAN** Activity Centres Facility Centre (Shop, Park, Recreation) Strategic Centres / Stations Main Road 0.5 Minor Road + + Railways kilometres

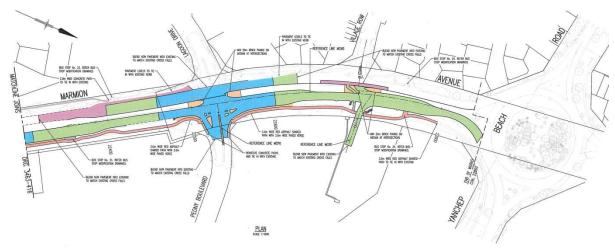
Figure 6. Yanchep Existing Pedestrian and Cycle Network

Source: City of Wanneroo (https://www.wanneroo.wa.gov.au/downloads/download/323/city of wanneroo bicycle plan)

Existing footpath and cycle facilities in the region along Marmion Avenue are currently sparse. However, as part of the duplication of Marmion Avenue between Yanchep Beach Road and Brighton that is currently underway, improved shared path connections are being constructed along the eastern side of the Marmion Avenue road reserve.

An excerpt of these plans illustrating the connection of the new Marmion Avenue shared path and the existing Yanchep Beach Road shared path, is shown in Figure 7.

Figure 7. Marmion Avenue Duplication Plans (south of Yanchep Beach Road)



Source: City of Wanneroo (https://www.wanneroo.wa.gov.au/directory\_record/424/marmion\_avenue\_dualling\_to\_yanchep)

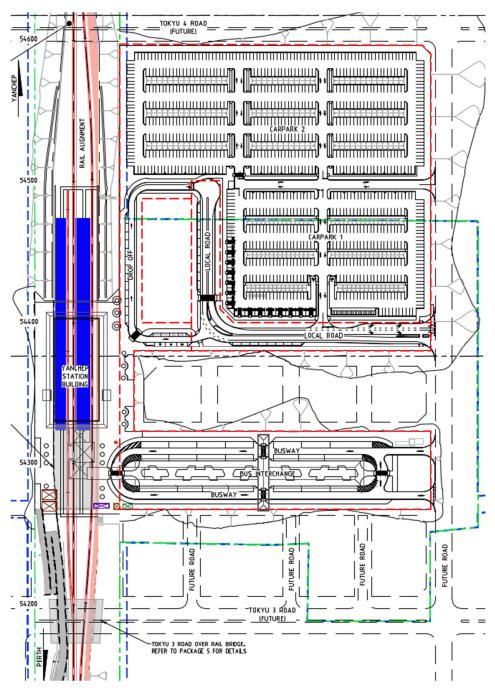
As a result of these works, this is anticipated to improve north-south cycle and pedestrian connectivity and will also integrate with the existing pathway present on the eastern side of Yanchep Beach Road. The connection of these wider regional paths is also expected to lay the groundwork for future connectivity along the future Marmion Avenue extension that will ultimately link to the proposed Yanchep Station.

# 3.0 DEVELOPMENT PROPOSAL

### 3.1 STATION LAYOUT

The proposed Yanchep Station seeks to provide a two platform train station along the Yanchep rail line, along with supporting infrastructure including a 969 bay long term car parking (Park & Ride) area, pick-up / drop-off (Kiss & Ride) parking zone, and a bus interchange. The general site layout is illustrated in Figure 8.

Figure 8. Yanchep Station Overall Plan



Yanchep Station is identified as a 'SP2' Strategic Centre Station Precinct under the *METRONET Station Precinct Design Guide* (2019), and the Station design is intended to support access to the station by walking, cycling, bus and car (Park n Ride and drop-off / pick up), and support a large catchment as an End of Line Station. The Yanchep Station design is consistent with the access priorities identified for this station, as is summarised below and in the following sections (including recommended access improvements by other authorities / development agencies).

Vehicle access to the site shall be via a series of new roads to be constructed which will connect the station site to the external road network, as illustrated in Section 3.4 and Section 4.1.2. At opening, primary site access to the external road network will be via an extension to the existing partial Marmion Avenue connection, located north of the Marmion Avenue / Yanchep Beach Road roundabout. A new east-west access road (Tokyu 3) will then be provided approximately 1.5 kilometres north of the roundabout, which will provide access to the Station site.

As the surrounding area develops over time and the Yanchep City Centre Structure Plan is implemented, additional local connections will be made available to the surrounding road network. Note that these new public roadways will be constructed by private developers and are part of a separate package of works outside of the Yanchep Station development.

As seen in the station plan in Figure 8, vehicle access to and from the site shall be via a north-south developer road which borders the eastern side of the site (referred to in this report as Local Access Road 2). Several site access points will be provided along this road, allowing for the movement of all inbound and outbound vehicles, including bus movements at station opening.

The proposed Yanchep bus interchange is located to the east of the station platforms. The interchange provides a total of 14 active bus bays along with 7 layover bus bays in a layout which provides for a circulatory roadway, allowing buses to recirculate within the station if required. Buses access the interchange via the north-south access road, with separate entry and exit crossover points being provided.

The long-term parking area (Park & Ride) is located north-east of the main station platforms. The car parking seeks to provide a minimum of 969 bays, which includes both long term bays and several specific use bays such as accessible (i.e. disabled) bays and electric vehicle charging bays. Further details on the parking supply are provided in Section 4.7.

Located adjacent to the station entrance and the long-term parking area is the station pick-up / drop-off area (Kiss & Ride), which provides for patron pick-ups and drop-offs in a clockwise circulation to allow for safe access to vehicles for station users.

As part of the station construction, a new north-south PSP is to be provided alongside the rail extension within the rail cutting. Access between the station plaza and the PSP is proposed to be via wheelchair friendly ramps provided at the southern end of the station site. Along with the PSP connectivity, end of trip facilities are to be provided including sheltered bicycle parking, a number of bicycle U-rails, drinking fountain and public toilets, with further details provided in Section 4.6.

#### 3.2 CHANGES TO SURROUNDING TRANSPORT NETWORKS

The development proposal of the Yanchep Station includes the construction of several new site access roads extending north from the current Yanchep Beach Road and Marmion Avenue roundabout. As the current sub section of Marmion Avenue already connects with the existing Yanchep Beach Road / Marmion Road roundabout, it is anticipated that this intersection treatment will not require any further modification. However, new intersection treatments will be required north of the existing roadway as it feeds into the proposed Yanchep Station site.

Beyond the access roads to be constructed as part of the Yanchep Station project, there are additional wider changes to the transport network in the surrounding area planned as part of the overarching Yanchep City Agreed Structure Plan No. 68 (June 2018) that are separate to the Yanchep Station works. Further to this, there is also a separate local Yanchep City Centre – Activity Centre Plan No. 100 (October 2017) which governs the area immediately surrounding the future station location.

This Activity Centre Plan is the prevailing masterplan for the Yanchep area and is compliant with the wider Yanchep City Structure Plan. The proposed future modifications included as part of these planning documents are discussed in further detail within Section 3.4: Committed Developments and Other Transport Proposals.

#### 3.3 INTEGRATION WITH SURROUNDING AREA

The proposed Yanchep Station is to be located on an area of land north-east of the existing Yanchep centre, which is currently unoccupied and has no existing land use. Similarly, the area surrounding the proposed station site is currently undeveloped. Therefore, the integration of the proposed station within the immediate area, based on the existing land use, is neither positive nor negative.

However, Yanchep Station is expected to become one of the key features of the future Yanchep City Activity Centre and the future residential / retail development associated with the Yanchep City Structure Plan included as part of that overall plan. Therefore, the presence of the proposed Yanchep Station within the City is expected to become a focal point for the future development of the local area and act as a catalyst for the implementation of the future local structure plan via the provision of a public transport hub to support the surrounding precinct.

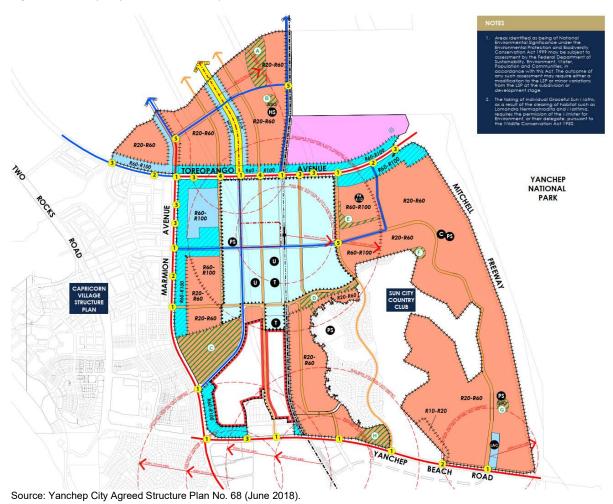
# 3.4 COMMITTED DEVELOPMENTS AND OTHER TRANSPORT PROPOSALS

### 3.4.1 YANCHEP CITY AGREED STRUCTURE PLAN NO. 68

As noted above, the Yanchep City Agreed Structure Plan No. 68 (June 2018) is the primary planning document which underpins the surrounding Yanchep area, of which the proposed Yanchep Station forms a critical component.

As per the masterplan, the wider Yanchep structure plan area is bounded by Marmion Avenue to the west and the future Mitchell Freeway extension to the east. Yanchep Beach Road forms the southern boundary to the area, while northern extent covers just beyond Toreopango Avenue. The structure plan area is illustrated in Figure 9.

Figure 9. Yanchep City Structure Plan Map



### 3.4.2 YANCHEP CITY ACTIVITY CENTRE AGREED STRUCTURE PLAN NO. 100

As outlined within the City Structure Plan, the area encompassing the proposed Yanchep Station is subject to the separate *Yanchep City Centre – Activity Centre Plan No. 100 (October 2017)*, of which the proposed Street Hierarchy is outlined in Figure 10.

Tor opal jo Avenue

Integrator Arterial A
Integrator Arterial B
Major City Street
Transit Street

\* minor city streets unmarked

Oncooped Cooped Coop

Figure 10. Yanchep City Centre - Activity Centre Plan Street Hierarchy

Source: Yanchep City Centre - Activity Centre Plan No. 100 (October 2017).

As seen in both of these structure plans, a network of future road connections in the area surrounding the future train station are proposed as part of the ultimate Yanchep City masterplan. Therefore, as part of the Yanchep Station development, it will be necessary to ensure that proposed road network changes as part of the station project provide sufficient connectivity to support the station and are compatible with the proposed movement network included within the Yanchep City Agreed Structure Plan.

Major road infrastructure over the long term includes the future extension of the Mitchell Freeway adjacent to the Yanchep City Centre, with potential freeway interchanges / connectivity at Yanchep Beach Road and/or Toreopango Avenue.

Key future changes to the movement network in the area surrounding the station include the extension of Marmion Avenue and Biara Road, which are both indicated as future District Distributor B type roadways. Given their relationship to the proposed location of the Yanchep Station, these roadways are expected to become the major access routes to and from the station site.

As can be seen in the Activity Centre Plan, multiple supporting neighbourhood connectors and local roads are expected to be provided over time in order to provide accessibility to individual lots. As per the street hierarchy, intersection controls are proposed at multiple major intersection points with the control type to be determined as part of the activity centre plan development.

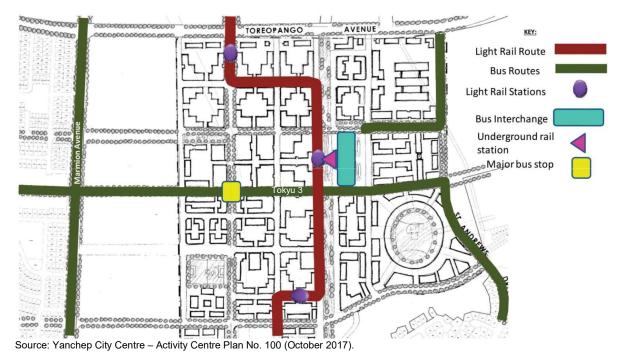
Currently, the implementation of the Yanchep City Structure Plan is in the early stages as the vast majority of the developable land identified in the scheme is still currently undeveloped and much of the supporting transport network has not yet been implemented. However, the proposed Yanchep

Station is a critical element of the overall structure plan and a major catalyst for the future development of the region.

Therefore, while the proposed Yanchep Station development does not include the construction of many of these major network transport connections as part of the project, the surrounding local district is prepared for the future expansion and development of the Station Precinct, as demonstrated by the planning included as part of the above structure plans.

Furthermore, the Yanchep Activity Centre Plan also outlines the proposed public transport network for the ultimate structure plan layout. The proposed network in relation to the future station is illustrated in Figure 11.

Figure 11. Yanchep City Centre – Activity Centre Plan Public Transport Routes



The above planning indicates that bus routes connecting to the Yanchep Station bus interchange are expected to primarily utilise both Marmion Avenue (north-south) and Biara Road (east-west) as routes which service the proposed Yanchep Station. Longer term planning allows for the provision of a future light rail route; however, this is not considered within the scope of works for the currently proposed Yanchep Station development.

# 3.4.3 YANCHEP ACTIVITY CENTRE STRUCTURE PLAN – INTEGRATED TRANSPORT NETWORK STRATEGY

The Yanchep Activity Centre Structure Plan – Integrated Transport Network Strategy was prepared by Jacobs in January 2015 to provide transport planning advice to support the creation of the Yanchep City Centre – Activity Centre Plan. The study primarily sought to examine the proposed road network and hierarchy within the Activity Centre, estimate the forecast demands and performance on the network, and provide recommendations on potential improvement or mitigation measures. The report also explored the future public transport network, bicycle network and pedestrian network within the subject area.

Utilising mode share and land usage projections for the Activity Centre, in addition to Main Roads Regional Operations Model (ROM), a mesoscopic traffic model of the area was prepared using SATURN software. The modelling outputs showed that a range of traffic projections were forecast on the internal road network, largely driven by the road hierarchy and the major land use trip generators.

The forecast daily traffic projections were summarised in 'bands' of vehicle demand for the activity centre roads and is shown in Figure 12.

Figure 12. Yanchep Activity Centre Structure Plan - Forecast Traffic Projections

Source: Yanchep Activity Centre Structure Plan - Integrated Transport Network Strategy (Jacobs, January 2015)

The modelling indicates that a forecast daily traffic demand of less than 5,000 vehicles per day is anticipated along the local access roads both east and west of the site. This information will be utilised in determining the background traffic projections along the adjacent road network as part of the analysis of the development access points in Section 4.0 of this Transport Impact Assessment.

# 4.0 ANALYSIS OF TRANSPORT NETWORKS

### 4.1 BACKGROUND AND APPROACH

The traffic assessment of the network surrounding the proposed Yanchep Station development is detailed within this section of the report. The goal of this assessment is to demonstrate that the transport infrastructure provided as part of the project is suitable for use and is capable of adequately accommodating the forecast transport demands associated with the future station.

#### 4.1.1 ASSESSMENT YEARS

For the Yanchep Station transport infrastructure assessment, the analysis focuses on the proposed opening year scenario of 2021, and a future year scenario of 2031 to account for the medium term development in the area and presence of nearby major infrastructure changes. This includes the road network and land use changes within the Yanchep City Centre that will be developed further over time, leading to additional connections and increased traffic generation in the surrounding area.

As the station is largely expected to accommodate work related trips to / from Yanchep City Centre and the Perth CBD, the assessment will focus primarily on the AM and PM peak periods. While weekend traffic is anticipated, both the station patronage and background traffic flows during the weekend are expected to be significantly lower than the respective weekday peaks.

The peak period intervals to be assessed are primarily based on the typical peak hour traffic flow data for the surrounding area and daily trip profiles of train stations with expected similar usage trends. This data indicates that the AM peak hour is likely to occur from 07:00 to 08:00 and the PM peak hour from 17:00 to 18:00.

#### 4.1.2 ASSUMED ROAD NETWORK

The Yanchep Station Transport Impact Assessment focuses on the opening year (2021) and future year (2031) scenarios, and is consistent with the *Yanchep City Centre – Activity Centre Plan No.* 100 which is the key planning framework guiding new development over this timeframe. The road network connections which are assumed to be delivered within these timeframes are critical to understanding the distribution of traffic flows to and from the Yanchep Station site.

Based on the Yanchep City Centre – Activity Centre Plan and liaison with private developers for the local road connections, an assumed staging for the road network plan has been prepared for the opening year scenario and future year scenario and is illustrated in Figure 13. The staging plan is formed on the best understanding of the information currently available.

Note that the assumed road network represents the minimum road infrastructure that is expected to be constructed by these timeframes. Additional road connectivity may be in place in these scenarios depending on individual developer schedules and the progress of independent land development.



Figure 13. Yanchep City Centre Assumed Road Network (2021 & 2031 Scenarios)

The road network in the Yanchep Station opening year scenario of 2021 primarily consists of the minimum road connections required to access the station, car parking areas and the bus interchange. This includes the extension of Marmion Avenue north of the current Yanchep Beach Road roundabout, through to the future Toreopango Avenue connection to the north (approximately 2.2 kilometre extension of Marmion Avenue).

The primary site access road to the Station in the opening year scenario of 2021 shall be via the new major east-west link currently known as 'Tokyu 3'. This connection will be constructed east of the new Marmion Avenue extension, and will extend through to the partial extension of St. Andrews Drive. Lastly, direct access to the Station frontage including Park & Ride and drop-off areas shall be via a short north-south connection currently referred to as 'Local Access Road 2'.

In the future year scenario of 2031, it is anticipated that many of the internal road connections within the Yanchep City Centre will be constructed, along with the remainder of Toreopango Avenue, including connection with Two Rocks Road.

### 4.1.3 INTERSECTIONS TO BE ASSESSED

The access arrangement for the opening year scenario of Yanchep Station proposes that all vehicular traffic (including Transperth buses) enter and exit the site via the main access on the future north-south road on the eastern boundary of the station site (Local Access Road 2). Along this roadway, a total of four crossover points will be provided which supply vehicle access to the bus interchange, short term drop-off area and long-term parking area.

Therefore, this assessment will focus on the direct site access points which are to be located along this roadway. In addition, the southern access to Car Park 1 via the local road leading to the Kiss & Ride area will also be assessed, as this will ultimately become a part of the public road network utilised by a variety of road users.

The four intersections to be assessed are shown in Figure 14 and comprise the following:

- Local Access Road 2 / Car Park #2 Access
- Local Access Road 2 / Kiss & Ride + Car Park #1 Access
- Local Road / Car Park #1 Access (Internal)
- Local Access Road 2 / Bus Interchange Egress

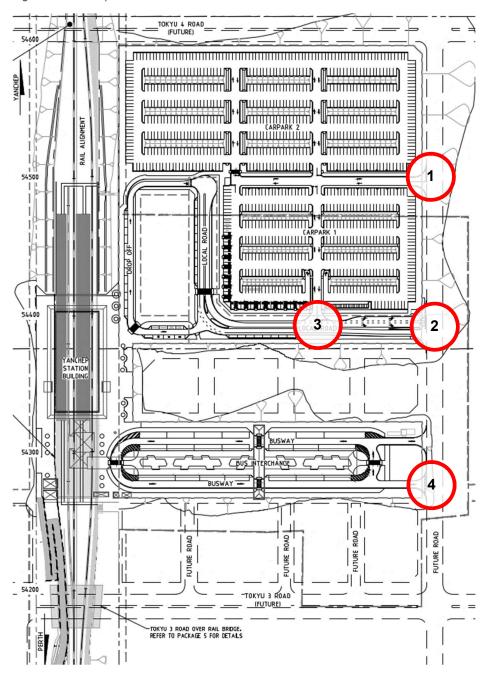


Figure 14. Yanchep Station - Intersection Assessment Locations

Note that while the adjacent north-south roadway (Local Access Road 2) is not being constructed by the NEWest Alliance and is instead to be constructed by the Yanchep Beach Joint Venture (YBJV), the site access points along this roadway are covered by this assessment due to the direct interaction of the Yanchep Station site with this roadway.

Given the existing Marmion Avenue / Yanchep Beach Road roundabout is anticipated to service a significant proportion of the ultimate Yanchep City Centre area (as outlined in the Activity Centre Plan No. 100) it is proposed that a performance analysis at the existing roundabout is not included as part of this Transport Assessment. The Yanchep City Centre is expected to include a significant increase in both residential and retail land use as part of the overall structure plan, that will ultimately result in a considerable increase in traffic demand over time.

Therefore, it is assumed that the long-term traffic requirements of the Marmion Avenue / Yanchep Beach Road roundabout will be monitored as part of ongoing network planning and land development in the area by the City of Wanneroo.

#### 4.1.4 ELEMENTS EXCLUDED FROM THIS ASSESSMENT

As the scope of works for the Yanchep Station includes only the elements immediately associated with the station (including rail line, PSP in rail reserve, station building and car parking) it is assumed that all other transport elements outside of this scope are not covered by this Transport Assessment.

Primarily, this includes all other developer roads surrounding the station site that are expected to be constructed as part of the wider Yanchep City Centre Activity Centre plan (including those roads present at the opening year of Yanchep Station). Examples of this include the Tokyu 3 road and extension to the existing Marmion Avenue.

As these roadways are not being constructed by NEWest, it is expected that the assessment of these roads will be subject to a separate transport assessment and approvals process by the respective developers.

#### 4.1.5 METHODOLOGY AND APPROACH

The overall approach to the transport assessment undertaken in this report is largely in line with the previous Yanchep Rail Extension Transport Assessment (May 2019) undertaken by WSP as part of the preliminary works leading up to the current engagement.

Baseline traffic demands along existing segments of the nearby road network have been sourced from Main Roads WA traffic count data. Traffic growth rates for the background traffic (if any background traffic is estimated) is then applied to the base traffic demand, for the respective assessment year. Traffic generated by the station development (including Park & Ride, Kiss & Ride as well as bus traffic) is then added on top of the background traffic, based on the forecast station patronage for that time period.

Note: Given that much of the surrounding area is not yet developed and the Yanchep City Centre Structure Plan likely has a development horizon of several decades for full build-out, the performance at intersections in the future will be heavily influenced by the number, size and type of surrounding developments within the structure plan area. As the timeframes for developing individual lots are unknown and future developments are subject to individual approvals, the increase in traffic demand on given segments of the network for a particular timeframe is difficult to predict.

Therefore, the analysis undertaken in this section of the assessment has been based on the estimated impact of the train station development plus the estimated background traffic growth only. The impact of additional developments and land uses, as they come online, has not been quantified within this assessment. The performance of the surrounding road network is an element that governing authorities will likely need to maintain and ensure ongoing monitoring as the structure plan is implemented over time and traffic demands in the area increase.

#### 4.1.6 PERFORMANCE METRICS AND LEVEL OF SERVICE TARGETS

The network results of the analysis summarised in this report are presented in terms of:

- Delay The average delay experienced per passenger car unit (measured in seconds).
- Level of Service (LoS) The LoS (ranging from A to F) provides an indicator of the performance of the network or individual movement based on the average delay per passenger car unit (pcu).
- Degree of Saturation (DoS) The DoS is a ratio of the demand to capacity, with DoS over 90 percent indicating a congested intersection, and DoS of 100 percent indicating an intersection at capacity and DOS over 100 percent indicating oversaturated conditions. The DoS provided represents the maximum DoS at the intersection.
- Queue The length of the average maximum back of queue (measured in number of passenger car units) on the approach measured over a number of cycles.
- As per the "8803-000-005 Specification Station Building and Civil Works", the level of service requirements for intersection performance specified by the Scope of Work and Technical Criteria (SWTC) are as follows:

#### 3.3 Level of Service for Intersections

The overall level of service (LOS) for intersections during peak periods (as defined in Transportation Research Board's Highway Capacity Manual - Special Report 209) shall be Level D or higher, with no individual major movement having a LOS lower than Level D and no individual minor movement having a LOS lower than Level E.

#### 4.2 **DEVELOPMENT TRIP GENERATION AND DISTRIBUTION**

This section outlines the key methodology and figures / assumptions utilised in order to determine the forecast trip generation and distribution profile associated with the proposed Yanchep Station.

#### 4.2.1 TRIP GENERATION

One of the major factors in calculating the trip generation associated with the site is the number of estimated daily station boardings. The agreed daily boardings have been developed through the Department of Transport STEM model and have been sourced from the Project Definition Report to remain consistent with previous assessments.

The forecast daily boardings for the Yanchep Station are shown in Table 7.

Table 7. Yanchep Station Daily Boardings Forecast

Year	2021	2031
Daily Boardings (passengers / day)	4,799	8,616

The Yanchep Station access mode share has been sourced from the Yanchep Rail Extension Transport Assessment (WSP for PTA, May 2019), which in turn based the adopted mode share figures from the Yanchep Rail Catchment Analysis Report (Arup for PTA, February 2018). The distribution of the mode share is based on Murdoch Station surveys undertaken by PTA in 2012 and has also been adjusted based on the forecast daily boardings and a Park & Ride occupancy of 1.2 persons per vehicle. The assumed mode share at Yanchep Station for the opening year of 2021 is shown in Table 8.

Table 8. Adopted 2021 Yanchep Station Mode Share

Access Mode	Mode Share (2021)
Walking	7%
Cycling	5%
Bus	46%
Kiss & Ride	14%
Park & Ride	28%
Total	100%

Based on the above mode share figures, this translates to a maximum parking accumulation of 1,067 vehicles in the year 2021. The current proposed total long-term parking provision at the Yanchep Station is 969 bays (including 939 standard parking bays and 30 accessible bays). Therefore, it is estimated that the parking accumulation in the opening year scenario equates to full utilisation of the available Park & Ride capacity.

As the forecast daily boardings increase through to the year 2031 by approximately 80%, it would be expected that the associated Park & Ride vehicle trip generation would also increase. However, as the Yanchep Station has a parking cap of 969 bays, the proportion of the mode share utilising the Park & Ride facility is also capped.

Therefore, the mode share for the future scenario of 2031 has been adjusted to account for this Park & Ride cap (assuming Park & Ride remains 100% utilised by 2031), while also accommodating the overall increase in patronage in the other transport modes. The assumed mode share at Yanchep Station for 2031 is shown in Table 9.

Table 9. Adopted 2031 Yanchep Station Mode Share

Access Mode	Mode Share (2031)
Walking	19%
Cycling	5%
Bus	46%
Kiss & Ride	15%
Park & Ride	15% (cap)
Total	100%

Lastly, the arrival and departure profile of vehicles is a critical element of the station trip generation. As per the methodology adopted in the earlier WSP Transport Assessment, the daily profile of boardings at Yanchep Station has been assumed to be comparable to the existing profile at Clarkson Station due to the similar journey time to the Perth CBD. Based on data collected at Clarkson Station, the inbound and outbound trip distribution for both Park & Ride and Kiss & Ride modes assumed for the Yanchep Station is summarised in Table 10.

Table 10. Adopted daily passenger Boarding / Alighting trip generation profile

Time (Hour		le Trips ger Boardings)		le Trips ger Alightings)
Beginning)	Park & Ride	Kiss & Ride	Park & Ride	Park & Ride
5:00	10%	6%	5:00	10%
6:00	24%	14%	6:00	24%
7:00	44%	31%	7:00	44%
8:00	7%	11%	8:00	7%
9:00	5%	6%	9:00	5%
10:00	1%	5%	10:00	1%
11:00	1%	3%	11:00	1%
12:00	0%	3%	12:00	0%
13:00	1%	2%	13:00	1%
14:00	1%	2%	14:00	1%
15:00	0%	3%	15:00	0%
16:00	2%	2%	16:00	2%
17:00	1%	5%	17:00	1%
18:00	2%	3%	18:00	2%
19:00	1%	2%	19:00	1%
20:00	0%	1%	20:00	0%
21:00	0%	0%	21:00	0%
Total	100%	99%	Total	100%

- Note: Some figures do not add up to 100% as the data does not cover a full 24-hour period.
- Note: Kiss & Ride Inbound and outbound vehicle trips for each passenger boarding and alighting
  are accounted for and are equal (i.e. inbound vehicle trips and outbound vehicle trips are equal
  for a given time period).

#### 4.2.2 DIRECTIONAL DISTRIBUTION OF TRAFFIC FLOWS

The directional distribution adopted for this assessment has largely utilised the same methodology employed in the previous Yanchep Rail Extension Transport Assessment (WSP for PTA, May 2019). The approach / departure behaviour and distribution of vehicles accessing the Yanchep Station parking facility assumes the following factors:

- i. Within the assessment timeframe (opening year and + 10 year scenario) Park & Ride traffic is assumed to arrive / depart exclusively via the proposed road that is situated immediately east of the Yanchep Station site (Local Access Road 2).
- ii. In the 2021 opening year scenario it is assumed that there is no road connection north of the station (i.e. Tokyu 4), therefore all car park and drop-off traffic will approach and depart via the south. By the year 2031, it is assumed that Tokyu 4 will be completed and a northern connection via Toreopango Avenue will be available. As such, it has been assumed that 20% of station traffic will originate and depart via the north in the 2031 future scenario.
- iii. All Kiss & Ride (drop-off) traffic will enter the site via the southern site access road (indicated as 'local road' connection).
- iv. Park & Ride traffic entering and exiting the 'Car Park 1' and 'Car Park 2' areas is assumed to distribute proportionally between the two available access points, based on the number of bays nearest to the respective access. Internal traffic distribution within the Yanchep Station car park is also based on a proportional split of the approximate number of bays accessible from the internal access points.

Directional distribution diagrams have been prepared based on the proposed external and internal access arrangements for both Park & Ride and Kiss & Ride transport modes. The distribution for the 2021 opening year is shown in Figure 15 and Figure 16, respectively. The distribution for the 2031 future year scenario is shown in Figure 17 and Figure 18, respectively.

Local Acces Road 2 Car Park 2 30% 70% 30% 30% 10% 10% Car Park 1 \_\_\_\_^ 30% 30% Drop Off 100% 100% **Bus Interchange** Legend 3% Inbound traffic Outbound traffic Tokyu 3

Figure 15. Park & Ride Directional Distribution – 2021 AM + PM peaks

Local Acces Road 2 Car Park 2 Car Park 1 100% 100% Drop Off 100% 100% 100% Bus Interchange 100% Legend 3% Inbound traffic Outbound traffic Tokyu 3

Figure 16. Kiss & Ride Directional Distribution – 2021 AM + PM peaks

Local Acces Road 2 Car Park 2 20% 20% 50% 30% 30% 30% 10% Car Park 1 20% 30% 30% Drop Off 80% Bus Interchange 80% Legend 3% Inbound traffic Outbound traffic Tokyu 3

Figure 17. Park & Ride Directional Distribution – 2031 AM + PM peaks

Local Acces Road 2 Car Park 2 20% 20% Car Park 1 20% 100% 80% Drop Off 100% 80% Bus Interchange 80% Legend 3% Inbound traffic Outbound traffic Tokyu 3

Figure 18. Kiss & Ride Directional Distribution – 2031 AM + PM peaks

#### 4.2.3 FINAL DEVELOPMENT TRAFFIC FLOWS

Based on a combination of the previously discussed passenger daily boardings, mode share assumptions and arrival / departure profiles, the final development traffic flows for the Yanchep Station site have been developed.

Note that these flows include both the peak hour background traffic on the road network (including any background traffic) plus the peak hour traffic generated by the development car park and bus interchange.

For the opening year scenario, it is assumed that there will be no other background traffic flows along the north-south local access road adjacent to the Yanchep Station site, as this road will not be connected to any other distributor road to the north by this time. Therefore, only station associated traffic will be expected to use the road in this scenario.

In the future scenario of 2031, it is assumed that Tokyu 4 will have been completed north of the station site. This major east-west distributor will then connect to the northern end of Local Access Road 2, which provides for site accessibility to the station. By this time, it is also expected that other local roadways and other land uses will have been completed in the area surrounding the Yanchep Station site and allowing for additional background traffic flows in the area. While traffic modelling information for the anticipated flows along these roads was not available at the time this report was prepared, for the purposes of this assessment a nominal background traffic flow of vehicles travelling past the station has been assumed.

As the Yanchep Station Local Access Road 2 is expected to be primarily a local connection (not a distributor road such as Tokyu 3 or Tokyu 4), a nominal background traffic demand of 5,000 vehicles per day (total for both directions) has been assumed for the year 2031. This background traffic assumption is compatible with the maximum estimated daily link traffic projections included within the Yanchep Activity Centre Structure Plan – Integrated Transport Network Strategy report prepared by Jacobs (January 2015). Therefore, this background traffic demand would be anticipated to represent an upper estimate of the traffic projection on this roadway and provide for a robust assessment of the intersections.

Assuming an approximate 10% demand during the peak periods, this equates to 500 vehicle per hour of background traffic adjacent to the station (split 50/50 between northbound and southbound directions). The final 2021 opening year AM and PM peak traffic flows are shown in Figure 19 and Figure 20, respectively. The final 2031 future year development flows for AM and PM peak periods are shown in Figure 21 and Figure 22, respectively.

Local Acces Road 2 Car Park 2 Car Park 1 Drop Off Bus Interchange Legend Light vehicles Heavy vehicles Transperth buses 

Figure 19. 2021 AM Peak Development Traffic Flows (07:00 – 08:00)

Tokyu 3

Local Acces Road 2 Car Park 2 Car Park 1 Drop Off **Bus Interchange** Legend Light vehicles Heavy vehicles Transperth buses 

Figure 20. 2021 PM Peak Development Traffic Flows (17:00 – 18:00)

Tokyu 3

Local Acces Road 2 Car Park 2 Car Park 1 Drop Off Bus Interchange Legend Light vehicles Heavy vehicles Transperth buses 

Figure 21. 2031 AM Peak Development Traffic Flows (07:00 – 08:00)

Tokyu 3

Local Acces Road 2 Car Park 2 Car Park 1 Drop Off Bus Interchange Legend Light vehicles Heavy vehicles Transperth buses Tokyu 3

Figure 22. 2031 PM Peak Development Traffic Flows (17:00 – 18:00)

### 4.3 ROAD NETWORK IMPACT ANALYSIS

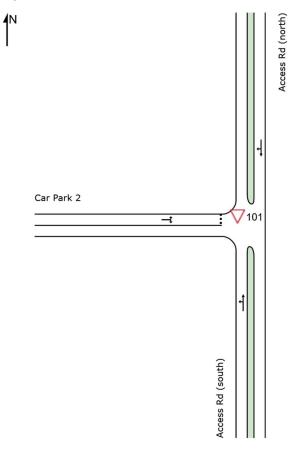
SIDRA Intersection analysis has been conducted on each of the identified main intersections featured as part of the Yanchep Station design. Input flows for each of the analyses undertaken have been sourced from the respective demand distribution diagrams shown in Section 4.2.3. The detailed analysis results for each intersection site are discussed in the following sections.

#### 4.3.1 LOCAL ACCESS ROAD 2 / CAR PARK #2 ACCESS

While the intersection configuration for the Car Park #2 access is due to be constructed by the private developer, for the purposes of this Transport Impact Assessment an appropriate intersection treatment has been assumed, based on the likely road carriageway configuration and demand profiles generated for the site. The recommended layout of this intersection will be communicated to the developer by NEWest in order to ensure compatibility between designs and adequate level of service is provided.

This intersection layout has been modelled within SIDRA Intersection analysis software and assessed for the relevant peak periods during both the 2021 'opening year' scenario and the 2031 'future year' scenario. The SIDRA layout of the Local Access Road 2 / Car Park #2 Access intersection is shown in Figure 23.

Figure 23. Local Access Road 2 / Car Park #2 Access Intersection Layout



Based on the above layout, peak hour intersection analyses were undertaken to determine the forecast performance of the access point and determine if any additional adjustments would be required to achieve the desired level of service targets. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 24. Local Access Road 2 / Car Park #2 Access - 2021 AM Peak Results

Mov	ement P	erformand	e - Vel	nicles								
Mov ID	Turn	Demand   Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Averag Speed km/
South	n: Access	Rd (south)		111112				110000				94,040,000
1	L2	329	0.0	0.178	4.6	LOSA	0.0	0.0	0.00	0.53	0.00	38.
2	T1	1	0.0	0.178	0.0	LOSA	0.0	0.0	0.00	0.53	0.00	36.
Appro	oach	330	0.0	0.178	4.6	NA	0.0	0.0	0.00	0.53	0.00	38.
North	: Access	Rd (north)										
8	T1	1	0.0	0.001	0.8	LOSA	0.0	0.0	0.35	0.26	0.35	39.
9	R2	1	0.0	0.001	4.8	LOSA	0.0	0.0	0.35	0.26	0.35	23.
Appro	oach	2	0.0	0.001	2.8	NA	0.0	0.0	0.35	0.26	0.35	29.
West	: Car Par	k 2										
10	L2	1	0.0	0.001	0.0	LOSA	0.0	0.0	0.00	0.07	0.00	20.
12	R2	1	0.0	0.001	0.8	LOSA	0.0	0.0	0.00	0.07	0.00	25.
Appro	oach	2	0.0	0.001	0.4	LOSA	0.0	0.0	0.00	0.07	0.00	23.
All Ve	hicles	334	0.0	0.178	4.6	NA	0.0	0.0	0.00	0.53	0.00	38.

Figure 25. Local Access Road 2 / Car Park #2 Access – 2021 PM Peak Results

Mov	Turn	Demand I	lows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance	Queued			Speed km/l
South	: Access	Rd (south)										
1	L2	7	0.0	0.004	4.6	LOSA	0.0	0.0	0.00	0.47	0.00	39.
2	T1	1	0.0	0.004	0.0	LOSA	0.0	0.0	0.00	0.47	0.00	37.
Appro	ach	8	0.0	0.004	4.0	NA	0.0	0.0	0.00	0.47	0.00	39.
North	: Access	Rd (north)										
8	T1	1	0.0	0.001	0.0	LOSA	0.0	0.0	0.04	0.27	0.04	42.
9	R2	1	0.0	0.001	3.9	LOSA	0.0	0.0	0.04	0.27	0.04	24.
Appro	ach	2	0.0	0.001	1.9	NA	0.0	0.0	0.04	0.27	0.04	30.
West:	Car Par	k 2										
10	L2	1	0.0	0.149	0.0	LOSA	0.4	2.7	0.02	0.14	0.02	20.
12	R2	232	0.0	0.149	0.6	LOSA	0.4	2.7	0.02	0.14	0.02	25.
Appro	ach	233	0.0	0.149	0.6	LOSA	0.4	2.7	0.02	0.14	0.02	25.
All Ve	hicles	243	0.0	0.149	0.7	NA	0.4	2.7	0.02	0.15	0.02	25.

Figure 26. Local Access Road 2 / Car Park #2 Access - 2031 AM Peak Results

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South	n: Access	Rd (south)										
1	L2	235	0.0	0.297	4.6	LOSA	0.0	0.0	0.00	0.23	0.00	43.3
2	T1	333	0.0	0.297	0.0	LOSA	0.0	0.0	0.00	0.23	0.00	43.0
Appro	oach	568	0.0	0.297	1.9	NA	0.0	0.0	0.00	0.23	0.00	43.1
North	: Access	Rd (north)										
8	T1	333	0.0	0.268	1.3	LOSA	1.2	8.6	0.34	0.15	0.35	41.0
9	R2	94	0.0	0.268	7.0	LOSA	1.2	8.6	0.34	0.15	0.35	24.2
Appro	oach	427	0.0	0.268	2.5	NA	1.2	8.6	0.34	0.15	0.35	35.0
West	Car Par	k 2										
10	L2	1	0.0	0.002	1.0	LOSA	0.0	0.0	0.35	0.25	0.35	20.0
12	R2	1	0.0	0.002	2.2	LOSA	0.0	0.0	0.35	0.25	0.35	24.4
Appro	oach	2	0.0	0.002	1.6	LOSA	0.0	0.0	0.35	0.25	0.35	22.2
All Ve	hicles	997	0.0	0.297	2.2	NA	1.2	8.6	0.15	0.19	0.15	39.5

Figure 27. Local Access Road 2 / Car Park #2 Access - 2031 PM Peak Results

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance m	Queued	Stop Rate	Cycles	Speed km/l
South	: Access	Rd (south)										
1	L2	7	0.0	0.156	4.6	LOSA	0.0	0.0	0.00	0.01	0.00	47.6
2	T1	297	0.0	0.156	0.0	LOSA	0.0	0.0	0.00	0.01	0.00	49.
Appro	ach	304	0.0	0.156	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.
North	: Access	Rd (north)										
8	T1	297	0.0	0.154	0.0	LOSA	0.0	0.1	0.01	0.00	0.01	49.8
9	R2	2	0.0	0.154	5.0	LOSA	0.0	0.1	0.01	0.00	0.01	26.6
Appro	ach	299	0.0	0.154	0.0	NA	0.0	0.1	0.01	0.00	0.01	49.4
West:	Car Par	k 2										
10	L2	66	0.0	0.199	1.1	LOSA	0.6	4.6	0.36	0.38	0.36	19.9
12	R2	165	0.0	0.199	1.8	LOSA	0.6	4.6	0.36	0.38	0.36	24.3
Appro	ach	231	0.0	0.199	1.6	LOSA	0.6	4.6	0.36	0.38	0.36	23.
All Ve	hicles	834	0.0	0.199	0.5	NA	0.6	4.6	0.10	0.11	0.10	35.4

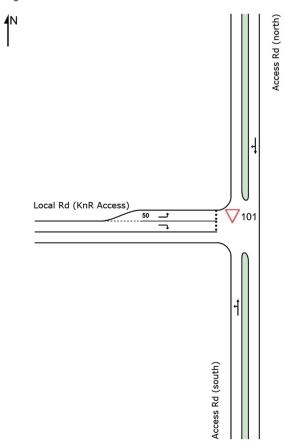
The intersection analysis results for the main Car Park #2 access point demonstrate that the assumed basic give-way intersection layout shown in Figure 23 is sufficient to accommodate the forecast flows generated by the car park. Both morning and afternoon peak periods in the future year 2031 scenario were forecast to function well, with the major turn movements all operating at a desirable Level of Service A. Additionally, the degree of saturation results suggest that the intersections are likely to operate well below practical capacity in the timeframes assessed.

### 4.3.2 LOCAL ACCESS ROAD 2 / KISS & RIDE + CAR PARK #1 ACCESS

Again, the intersection configuration for the Kiss & Ride and Car Park #1 access point is due to be constructed by the private developer. For the purposes of this Transport Impact Assessment an appropriate intersection treatment has been assumed, based on the likely road carriageway configuration and demand profiles generated for the site. The recommended layout of this intersection will be communicated to the developer by NEWest in order to ensure compatibility between designs and adequate level of service is provided.

This intersection layout has been modelled within SIDRA Intersection and assessed for the relevant peak periods during both the 2021 'opening year' scenario and the 2031 'future year' scenario. The SIDRA layout of the Kiss & Ride and Car Park #1 Access intersection is shown in Figure 28.

Figure 28. Local Access Road 2 / Car Park #2 Access Intersection Layout



Based on the above layout, peak hour intersection analyses were undertaken to determine the forecast performance of the access point and determine if any additional adjustments would be required to achieve the desired level of service targets for intersection performance. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Note that the configuration of this intersection may need to be revisited if additional developments or traffic flows which are not yet known are expected to utilise this access point, or if significant changes to the traffic distribution in the area are anticipated. The traffic demand originating from future development not captured in this assessment may cause additional congestion or disruption to traffic flows. In this event, the intersection treatment should be investigated to determine if the additional development and associated traffic demand triggers the need for an intersection layout capable of accommodating a higher vehicle flow.

Figure 29. Local Access Road 2 / Kiss & Ride + Car Park #2 Access - 2021 AM Peak Results

Move	ement P	erformand	e - Vel	nicles								
Mov ID	Turn	Demand I Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Averag Speed km/
South	: Access	Rd (south)										
1	L2	356	0.0	0.360	4.6	LOSA	0.0	0.0	0.00	0.28	0.00	41.
2	T1	329	0.0	0.360	0.0	LOSA	0.0	0.0	0.00	0.28	0.00	42.
Appro	ach	685	0.0	0.360	2.4	NA	0.0	0.0	0.00	0.28	0.00	42.
North	Access	Rd (north)										
8	T1	1	0.0	0.002	2.4	LOSA	0.0	0.1	0.52	0.29	0.52	36.
9	R2	1	0.0	0.002	7.5	LOSA	0.0	0.1	0.52	0.29	0.52	25.
Appro	ach	2	0.0	0.002	5.0	NA	0.0	0.1	0.52	0.29	0.52	29.
West:	Local R	d (KnR Acce	ess)									
10	L2	1	0.0	0.001	1.0	LOSA	0.0	0.0	0.37	0.16	0.37	24.
12	R2	215	0.0	0.182	1.6	LOSA	0.5	3.4	0.33	0.38	0.33	23.
Appro	ach	216	0.0	0.182	1.6	LOSA	0.5	3.4	0.33	0.38	0.33	23.
All Ve	hicles	903	0.0	0.360	2.2	NA	0.5	3.4	0.08	0.31	0.08	34.

Figure 30. Local Access Road 2 / Kiss & Ride + Car Park #2 Access - 2021 PM Peak Results

Move	ement F	erformanc	e - Vel	nicles								
Mov ID	Turn	Demand I Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/l
South	: Access	Rd (south)										7
1	L2	124	0.0	0.070	4.6	LOSA	0.0	0.0	0.00	0.50	0.00	37.6
2	T1	7	0.0	0.070	0.0	LOSA	0.0	0.0	0.00	0.50	0.00	38.0
Appro	ach	131	0.0	0.070	4.4	NA	0.0	0.0	0.00	0.50	0.00	37.7
North	: Access	Rd (north)										
8	T1	232	0.0	0.120	0.0	LOSA	0.0	0.1	0.00	0.00	0.00	49.9
9	R2	1	0.0	0.120	5.0	LOSA	0.0	0.1	0.00	0.00	0.00	30.3
Appro	ach	233	0.0	0.120	0.0	NA	0.0	0.1	0.00	0.00	0.00	49.7
West:	Local R	d (KnR Acce	ess)									
10	L2	1	0.0	0.001	0.0	LOSA	0.0	0.0	0.04	0.00	0.04	25.9
12	R2	220	0.0	0.164	1.1	LOSA	0.4	3.1	0.23	0.27	0.23	23.2
Appro	ach	221	0.0	0.164	1.1	LOSA	0.4	3.1	0.23	0.27	0.23	23.2
All Ve	hicles	585	0.0	0.164	1.4	NA	0.4	3.1	0.09	0.22	0.09	32.6

Figure 31. Local Access Road 2 / Kiss & Ride + Car Park #2 Access - 2031 AM Peak Results

Move	ement F	erformand	ce - Vel	nicles								
Mov ID	Turn	Demand l Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Averag Speed km/
South	: Access	Rd (south)										
1	L2	472	0.0	0.503	4.6	LOSA	0.0	0.0	0.00	0.27	0.00	41.
2	T1	485	0.0	0.503	0.0	LOSA	0.0	0.0	0.00	0.27	0.00	42.
Appro	ach	957	0.0	0.503	2.3	NA	0.0	0.0	0.00	0.27	0.00	42.
North	: Access	Rd (north)										
8	T1	250	0.0	0.289	5.0	LOSA	2.0	15.1	0.59	0.21	0.72	33.
9	R2	83	0.0	0.289	12.9	LOS B	2.0	15.1	0.59	0.21	0.72	24.3
Appro	ach	333	0.0	0.289	7.0	NA	2.0	15.1	0.59	0.21	0.72	29.
West:	Local R	d (KnR Acce	ess)									
10	L2	83	0.0	0.082	1.9	LOSA	0.3	2.3	0.47	0.38	0.47	24.
12	R2	331	0.0	0.422	4.4	LOSA	1.5	10.9	0.63	0.85	0.86	21.
Appro	ach	414	0.0	0.422	3.9	LOSA	1.5	10.9	0.60	0.75	0.79	21.
All Ve	hicles	1704	0.0	0.503	3.6	NA	2.0	15.1	0.26	0.38	0.33	32.

Figure 32. Local Access Road 2 / Kiss & Ride + Car Park #2 Access - 2031 PM Peak Results

Move	ement P	erformand	e - Vel	nicles								
Mov ID	Turn	Demand I Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Averag Speed km/
South	: Access	Rd (south)										7,111111
1	L2	189	0.0	0.233	4.6	LOSA	0.0	0.0	0.00	0.23	0.00	42.
2	T1	255	0.0	0.233	0.0	LOSA	0.0	0.0	0.00	0.23	0.00	43.
Appro	ach	444	0.0	0.233	2.0	NA	0.0	0.0	0.00	0.23	0.00	43.
North	: Access	Rd (north)										
8	T1	415	0.0	0.254	0.4	LOSA	0.5	3.9	0.15	0.06	0.15	46.
9	R2	47	0.0	0.254	6.8	LOSA	0.5	3.9	0.15	0.06	0.15	29.
Appro	ach	462	0.0	0.254	1.0	NA	0.5	3.9	0.15	0.06	0.15	43.
West:	Local R	d (KnR Acce	ess)									
10	L2	47	0.0	0.036	0.8	LOSA	0.1	1.0	0.32	0.18	0.32	25.
12	R2	285	0.0	0.293	2.7	LOSA	0.9	6.7	0.46	0.60	0.53	22.
Appro	ach	332	0.0	0.293	2.4	LOSA	0.9	6.7	0.44	0.54	0.50	22.
All Ve	hicles	1238	0.0	0.293	1.7	NA	0.9	6.7	0.17	0.25	0.19	34.

The access point to the Kiss & Ride area and Car Park #1 is a key element in the overall function of the Yanchep Station, as the majority of peak hour vehicle movements are expected to pass through this intersection.

The assessment shows that this access point is forecast to operate at a satisfactory level through to the 2031 future scenario. With the assumed background traffic along the north-south access road of 5,000 vehicles per day it was found that the 2031 AM peak period was the critical time period in the analysis, with over 1,700 vehicles passing through this intersection in the hour. The results demonstrate that the majority of movements through the intersection are expected to operate at a Level of Service A in the critical 2031 AM peak period.

A high proportion of vehicles utilising the Kiss & Ride facility in the year 2031 are still assumed to approach and depart via the south of the station (80% in this assessment). This means that there is a high demand for right turning vehicles exiting the Park & Ride facility via the internal local road connection. The analysis indicates that this movement is expected to operate at approximately 0.42 degree of saturation in the year 2031.

It is known that give-way intersections can be sensitive to the size and frequency of gaps in oncoming traffic flows to allow for turning vehicles to be accommodated in a reasonable manner. Should the background traffic flows along the north-south access road be significantly higher than the assumed 5,000 vehicles per day due to additional development or changes to surrounding land usage, the intersection treatment at this location may need to be reassessed at a later date to maintain satisfactory level of service and safety for turning vehicles.

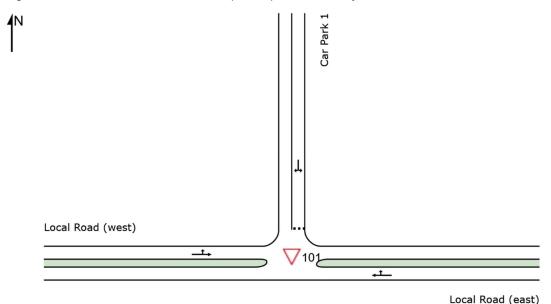
Additionally, the site access arrangements and traffic generation for future land uses in the area surrounding the Yanchep Station may also contribute to increased vehicle demand along the adjacent roadways – although it is noted that these flows are not related to Yanchep Station. Therefore, it would be recommended that further studies be undertaken at the main Kiss & Ride access point as part of the assessment of future development of nearby lots, once future access arrangements and traffic generation by other new land uses is confirmed by the respective developers.

# 4.3.3 LOCAL ROAD / CAR PARK #1 ACCESS (INTERNAL)

This intersection is due to be constructed by NEWest as part of the wider station works and will serve as one of the main access points to the Car Park #1 area for Yanchep Station. This section of the car park is located nearest the station entrance and includes accessible (ACROD) parking, PTA staff parking and motorcycle parking.

This intersection layout has been modelled within SIDRA Intersection analysis software and assessed for the relevant peak periods during both the 2021 'opening year' scenario and the 2031 'future year' scenario. The SIDRA layout of the internal Local Road / Car Park #1 Access intersection is shown in Figure 33.

Figure 33. Local Road / Car Park #1 Access (Internal) Intersection Layout



Based on the above layout, peak hour intersection analyses were undertaken to determine the forecast performance of the access point and determine if any additional adjustments would be required to achieve the desired level of service targets for intersection performance. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 34. Local Road / Car Park #1 Access (Internal) – 2021 AM Peak Results

Mov	ement P	erformand	ce - Vel	nicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/
East:	Local Ro	ad (east)										
5	T1	215	0.0	0.208	0.5	LOSA	0.9	6.6	0.28	0.21	0.28	33.9
6	R2	141	0.0	0.208	4.4	LOSA	0.9	6.6	0.28	0.21	0.28	27.
Appro	oach	356	0.0	0.208	2.0	NA	0.9	6.6	0.28	0.21	0.28	31.
North	: Car Par	k 1										
7	L2	1	0.0	0.002	0.6	LOSA	0.0	0.0	0.27	0.18	0.27	25.
9	R2	1	0.0	0.002	1.5	LOSA	0.0	0.0	0.27	0.18	0.27	24.
Appro	oach	2	0.0	0.002	1.0	LOSA	0.0	0.0	0.27	0.18	0.27	25.
West	: Local R	oad (west)										
10	L2	1	0.0	0.111	3.4	LOSA	0.0	0.0	0.00	0.00	0.00	24.
11	T1	215	0.0	0.111	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	39.
Appro	oach	216	0.0	0.111	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.
All Ve	hicles	574	0.0	0.208	1.3	NA	0.9	6.6	0.17	0.13	0.17	34.

Figure 35. Local Road / Car Park #1 Access (Internal) - 2021 PM Peak Results

Mov	ement P	erformand	ce - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East:	Local Ro	ad (east)										
5	T1	121	0.0	0.064	0.0	LOSA	0.0	0.1	0.01	0.01	0.01	39.6
6	R2	3	0.0	0.064	3.9	LOSA	0.0	0.1	0.01	0.01	0.01	32.2
Appro	oach	124	0.0	0.064	0.1	NA	0.0	0.1	0.01	0.01	0.01	39.4
North	: Car Par	k 1										
7	L2	99	0.0	0.068	0.4	LOSA	0.3	1.9	0.22	0.09	0.22	26.2
9	R2	1	0.0	0.068	1.0	LOSA	0.3	1.9	0.22	0.09	0.22	25.1
Appro	oach	100	0.0	0.068	0.4	LOSA	0.3	1.9	0.22	0.09	0.22	26.1
West	Local R	oad (west)										
10	L2	1	0.0	0.063	3.4	LOSA	0.0	0.0	0.00	0.00	0.00	24.6
11	T1	121	0.0	0.063	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	39.9
Appro	oach	122	0.0	0.063	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.7
All Ve	hicles	346	0.0	0.068	0.2	NA	0.3	1.9	0.07	0.03	0.07	34.8

Figure 36. Local Road / Car Park #1 Access (Internal) - 2031 AM Peak Results

Move	ement F	erformand	ce - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Averag Speed km/
East:	Local Ro	oad (east)										
5	T1	414	0.0	0.333	1.0	LOSA	1.6	10.9	0.33	0.16	0.35	34.4
6	R2	141	0.0	0.333	5.8	LOSA	1.6	10.9	0.33	0.16	0.35	28.2
Appro	oach	555	0.0	0.333	2.2	NA	1.6	10.9	0.33	0.16	0.35	32.7
North	: Car Pa	rk 1										
7	L2	1	0.0	0.002	1.3	LOSA	0.0	0.0	0.40	0.29	0.40	24.9
9	R2	1	0.0	0.002	2.5	LOSA	0.0	0.0	0.40	0.29	0.40	23.9
Appro	oach	2	0.0	0.002	1.9	LOSA	0.0	0.0	0.40	0.29	0.40	24.4
West:	Local R	oad (west)										
10	L2	1	0.0	0.213	3.4	LOSA	0.0	0.0	0.00	0.00	0.00	24.6
11	T1	414	0.0	0.213	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	40.0
Appro	oach	415	0.0	0.213	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Ve	hicles	972	0.0	0.333	1.3	NA	1.6	10.9	0.19	0.09	0.20	35.5

Figure 37. Local Road / Car Park #1 Access (Internal) - 2031 PM Peak Results

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	10111	Total	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate		Speed
		veh/h	%	v/c	sec		veh	m		977		km/t
East:	Local Ro	oad (east)										
5	T1	233	0.0	0.122	0.0	LOSA	0.0	0.2	0.01	0.01	0.01	39.7
6	R2	3	0.0	0.122	4.4	LOSA	0.0	0.2	0.01	0.01	0.01	32.3
Appro	oach	236	0.0	0.122	0.1	NA	0.0	0.2	0.01	0.01	0.01	39.6
North	: Car Pa	rk 1										
7	L2	99	0.0	0.075	0.8	LOSA	0.3	2.1	0.32	0.19	0.32	25.6
9	R2	1	0.0	0.075	1.4	LOSA	0.3	2.1	0.32	0.19	0.32	24.6
Appro	oach	100	0.0	0.075	0.8	LOSA	0.3	2.1	0.32	0.19	0.32	25.6
West	Local R	oad (west)										
10	L2	1	0.0	0.120	3.4	LOSA	0.0	0.0	0.00	0.00	0.00	24.6
11	T1	233	0.0	0.120	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	39.9
Appro	oach	234	0.0	0.120	0.0	NA	0.0	0.0	0.00	0.00	0.00	39.9
All Ve	hicles	570	0.0	0.122	0.2	NA	0.3	2.1	0.06	0.04	0.06	36.5

The performance of the internal Car Park #1 access point along the Local Road leading to the Kiss & Ride facility is another key element of the station design which contributes to the overall operation of the site. It is important that this intersection operates at a satisfactory level to ensure that internal congestion is mitigated and that delays getting to and from the Kiss & Ride area are limited.

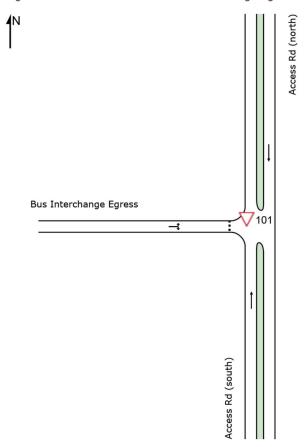
The results of the analysis show that this access point is expected to operate well, with all turning movements forecast to operate at a Level of Service A during the 2031 peak periods. The longest delay observed is for right turning vehicles entering Car Park #1 from the east, with an average delay of 5.8 seconds reported. Although this may cause partial slowdown of westbound vehicles approaching the Kiss & Ride area, the delays are minimal and are not expected to significantly affect traffic progression on the internal roadway.

# 4.3.4 LOCAL ACCESS ROAD 2 / BUS INTERCHANGE EGRESS

The intersection configuration for the Bus Interchange is due to be constructed by the private developer, for the purposes of this Transport Assessment an appropriate intersection treatment has been assumed, based on the demand profiles generated for the site. The recommended layout of this intersection will be communicated to the developer by NEWest in order to ensure compatibility between designs and adequate level of service is provided for Transperth buses accessing the Yanchep Station bus interchange

This intersection layout has been modelled within SIDRA Intersection and assessed for the relevant peak periods during both the 2021 'opening year' scenario and the 2031 'future year' scenario. The SIDRA layout of the Kiss & Ride and Car Park #1 Access intersection is shown in Figure 38.

Figure 38. Local Access Road 2 / Bus Interchange Egress Intersection Layout



Based on the above layout, peak hour intersection analyses were undertaken to determine the forecast performance of the access point and determine if any additional adjustments would be required to achieve the desired level of service targets for intersection performance. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 39. Local Access Road 2 / Bus Interchange Egress – 2021 AM Peak Results

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance m	Queued	Stop Rate	Cycles	Speed km/h
South	: Access	Rd (south	)									
2	T1	714	4.2	0.397	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
Appro	ach	714	4.2	0.397	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
North	Access	Rd (north)										
8	T1	215	0.0	0.110	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Appro	ach	215	0.0	0.110	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West:	Bus Inte	erchange E	gress									
10	L2	1	0.0	0.077	3.6	LOSA	0.2	4.0	0.64	0.72	0.64	17.6
12	R2	30	100.0	0.077	7.1	LOSA	0.2	4.0	0.64	0.72	0.64	19.3
Appro	ach	31	96.8	0.077	7.0	LOSA	0.2	4.0	0.64	0.72	0.64	19.2
All Ve	hicles	960	6.3	0.397	0.2	NA	0.2	4.0	0.02	0.02	0.02	44.3

Figure 40. Local Access Road 2 / Bus Interchange Egress – 2021 PM Peak Results

Move	ement P	erformar	ice - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	l Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Access	Rd (south	)									
2	T1	162	18.5	0.114	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Appro	oach	162	18.5	0.114	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North	: Access	Rd (north)										
8	T1	452	0.0	0.232	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Appro	oach	452	0.0	0.232	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West	Bus Inte	erchange E	gress									
10	L2	1	0.0	0.051	0.5	LOSA	0.1	2.6	0.42	0.52	0.42	18.8
12	R2	30	100.0	0.051	3.9	LOSA	0.1	2.6	0.42	0.52	0.42	20.5
Appro	oach	31	96.8	0.051	3.8	LOSA	0.1	2.6	0.42	0.52	0.42	20.4
All Ve	hicles	645	9.3	0.232	0.2	NA	0.1	2.6	0.02	0.03	0.02	42.8

Figure 41. Local Access Road 2 / Bus Interchange Egress – 2031 AM Peak Results

Move	ement P	erforman	ice - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	l Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	
South	: Access	Rd (south	)									
2	T1	986	3.0	0.536	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
Appro	ach	986	3.0	0.536	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
North	: Access	Rd (north)										
8	T1	581	0.0	0.298	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Appro	ach	581	0.0	0.298	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West:	Bus Inte	rchange E	gress									
10	L2	1	0.0	0.226	8.6	LOSA	0.6	11.7	0.90	0.97	0.97	12.9
12	R2	30	100.0	0.226	24.9	LOSC	0.6	11.7	0.90	0.97	0.97	14.5
Appro	ach	31	96.8	0.226	24.4	LOSC	0.6	11.7	0.90	0.97	0.97	14.5
All Ve	hicles	1598	3.8	0.536	0.5	NA	0.6	11.7	0.02	0.02	0.02	44.6

Figure 42. Local Access Road 2 / Bus Interchange Egress – 2031 PM Peak Results

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance m	Queued			Speed km/h
South	: Access	Rd (south	)		200		10760=110	- 34040				1100000000
2	T1	475	6.3	0.274	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	50.0
Appro	ach	475	6.3	0.274	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North	: Access	Rd (north)										
8	T1	701	0.0	0.359	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	49.9
Appro	ach	701	0.0	0.359	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West:	Bus Inte	rchange E	gress									
10	L2	1	0.0	0.104	1.9	LOSA	0.3	5.4	0.73	0.79	0.73	16.6
12	R2	30	100.0	0.104	10.3	LOS B	0.3	5.4	0.73	0.79	0.73	18.2
Appro	ach	31	96.8	0.104	10.0	LOS B	0.3	5.4	0.73	0.79	0.73	18.2
All Ve	hicles	1207	5.0	0.359	0.3	NA	0.3	5.4	0.02	0.02	0.02	45.0

The final significant road transport element of the overall Yanchep Station design are the bus interchange access and egress points. Note that for this assessment, the bus interchange entry point has not been analysed, as all bus routes are anticipated to approach from the south of the interchange resulting in no traffic delays for entering buses.

The analysis results of the bus interchange egress indicate that the buses departing from the interchange during the critical 2031 AM peak period are likely to experience an average delay of approximately 25 seconds, equating to a Level of Service C. While the assessment shows that buses are likely to experience some delay when exiting the interchange, this forecast wait time is expected to be within manageable levels.

Again, as give-way intersections can be sensitive to the size and frequency of gaps in oncoming traffic flows (particularly when larger vehicles such as buses are involved) the traffic demand along the main north-south access road adjacent to the bus interchange can potentially impact the level of performance at the bus egress. Should the future traffic along the access road exceed the assumed 5,000 vehicle per day demand, further traffic analysis investigation of the bus egress will be required in order to maintain satisfactory delays for buses departing the station.

# 4.4 PUBLIC TRANSPORT ROUTES AND SERVICING

With the introduction of the new YRE and the associated bus interchanges at each of the stations along the route, adjustments to existing bus routes and the introduction of new services are expected.

The future Transperth bus network proposed to service the Yanchep Station bus interchange is outlined in Table 11. This information has been supplied by PTA / Transperth and is subject to changes or adjustments pending resourcing assessment and community consultation.

Table 11. Yanchep Station - Planned bus services

Route	He	eadway (mins)	Notes
Route	Peak	Inter-Peak / Off-Peak	Notes
489 via Two Rocks Road (south)	10	30	
490 via Marmion Avenue (south)	20	30	Coordinated with 491
491 via St Andrews Drive	20	30	Coordinated with 490
493 via Two Rocks Road (north)	10	30	

An additional Route 492 may not serve Yanchep upon opening as it requires connection between St. Andrews Estate and new east-west road. Alternative service route may be investigated by PTA / Transperth depending on road connectivity.

It is noted that a significant amount of the road network servicing the Yanchep City Centre is expected to be constructed over a long period of time. Given the development in the area, it is likely that future bus services will be reviewed as the surrounding developments and land usage develops over time. Therefore, it is possible that the above bus services may be adjusted by the future scenario timeframe of 2031.

# 4.5 BUS INTERCHANGE

The bus interchange at Yanchep Station will be located on the east of the rail corridor, and accessible to the south-east of the main station building. The Schedule of Accommodation details that the bus interchange should at minimum include a total of 14 active bays (which includes one articulated bay) and at least 7 layover bays (including one articulated bay), which the proposed design satisfies.

Figure 43 illustrates how Transperth buses and pedestrians will integrate within the bus interchange and the potential location of the active and layover bays.

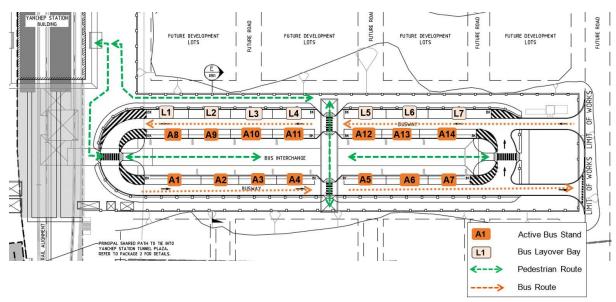


Figure 43. Yanchep Station Bus Interchange

# 4.6 PEDESTRIAN & CYCLE ACCESS

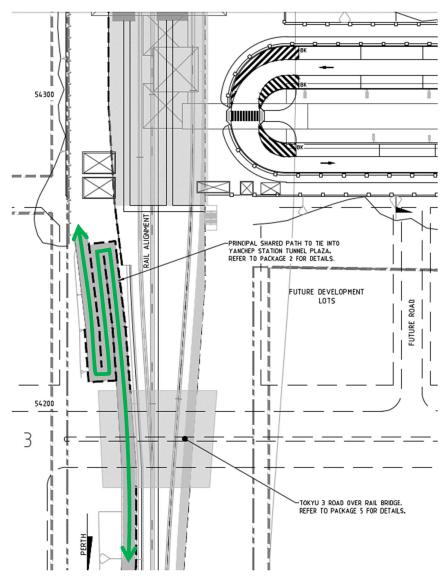
# 4.6.1 PSP CONNECTIVITY

A major element of the METRONET YRE project includes the provision of a new PSP corridor within the rail reserve that covers the full length of the project from Butler through to Yanchep. This infrastructure comprises a high-quality grade-separated PSP connection which follows the entire rail corridor. The proposed PSP includes a 4.0 metre wide shared path with 0.5 metre shoulders on either side (5.0 metre wide corridor in total) – as per current Department of Transport guidelines for a high demand PSP connection. The path itself is proposed to operate along the western side of the rail corridor with bicycle parking facilities located in close proximity to the station entry, and connections provided at key points along the network.

As per the current concept design plans, it is proposed that the PSP will be dropped to pass under the proposed Tokyu 3 road bridge south of the station and ramp up near the bicycle shelters at ground level. The PSP crossing under the bridge must provide a 4.6 metre wide clear width between handrails / walls as required in the Schedule of Accommodation.

# The proposed PSP alignment and ramp location for Yanchep Station are illustrated in Figure 44.

Figure 44. Yanchep Station – PSP Alignment and Ramp Arrangement



# 4.6.2 ADDITIONAL CONNECTIVITY

In the opening year scenario of 2021, the other major external cycle connectivity is expected to be via the Marmion Avenue and Tokyu 3 connections, which would be anticipated to provide wider cycle and pedestrian access to the existing residential areas to the western side of Marmion Avenue. Part of the opening scenario road network is also expected to include extension to the existing St. Andrews Drive (south-east of the Station), which is expected to provide a relatively direct access to patrons located within the St. Andrews residential catchment.

Over time, through development of the surrounding area in accordance with the *Yanchep City Centre – Activity Centre Plan*, it is also expected that many of the local distributor and connector roads within the City Centre will further enhance pedestrian and cycle connectivity to the surrounding region and support the long term mode share targets for the Yanchep Station.

The City of Wanneroo has supplied the Draft Long-Term Cycle Network Plan for the area surrounding the Yanchep Station, which highlights several key routes within the surrounding local region that will ultimately provide for cycle and pedestrian access, and the planned hierarchy of the routes. Note that this plan may be subject to change or revision by City of Wanneroo as ongoing consultation continues. The Draft Long-Term Cycle Network Plan is shown in Figure 45.

Figure 45. City of Wanneroo Draft Long Term Cycle Network Plan (Yanchep Rail Precinct)

Source: City of Wanneroo

# 4.6.3 CYCLE PARKING AND END OF TRIP FACILITIES

As per the Schedule of Accommodation for Yanchep Station (Section 19.1.7) referenced in the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria, the Yanchep Station bicycle parking provision is summarised below:

- 10 bicycle U-rails.
- 2x 96 bicycle parking capacity secure parking shelters (PTA standard 00-A-09-0159-TYPE B Module Arrangement).
- Allowance for inclusion of 1x additional 96 bicycle parking capacity secure shelter.
- Bicycle storage to accommodate 2.6% of expected patronage (calculated up to 4 years in advance).

Based on the forecast patronage for Yanchep Station, the minimum bicycle parking required for the Station opening (2021) is 125 spaces, and by 2031 is 224 spaces. The proposed design allowance for up to 3 x 96 bicycle parking capacity shelters will exceed the forecast 2031 bicycle parking demand.

Note that no showers or change rooms are required to be provided as part of the Schedule of Accommodation for Yanchep Station. Similarly, secure locker facilities are not required to be provided. The proposed bike shelters are located adjacent to the PSP access and are highlighted in Figure 46.

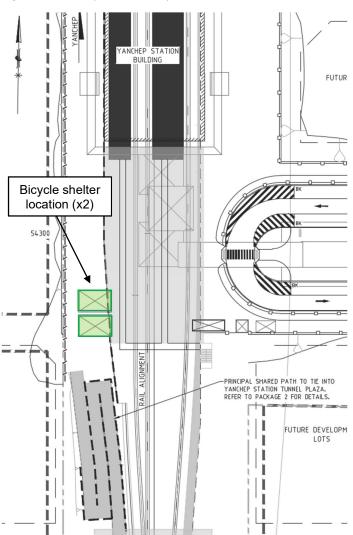


Figure 46. Yanchep Station – Bicycle shelter location

# 4.7 VEHICLE PARKING

As per the Schedule of Accommodation for Yanchep Station (Section 19.1.7) referenced in the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria, the vehicle parking provision within the Yanchep Station concept design is summarised in Table 12.

Table 12. Yanchep Station - Parking Provision

	Туре	Provision
	Standard parking bays	937
	Accessible bays (ACROD)	30
Long Term Parking	Electric car charging bays	2
(Park & Ride)	Total Long Term Car Parking Bays	969
	Motorcycle bays (over and above car parking bays)	26
	Drop-off bays	14
Short Term Parking	Accessible bays (ACROD)	3
(including Kiss & Ride)	Taxi bays	2
	Taxi bays (ACROD)	1

In addition to the above parking supply, the following service bays are provided for use by PTA staff and other emergency services for the safe and ongoing operation of the station (in accordance with Schedule of Accommodation requirements).

- 2 emergency service bays (ambulance and state transit police).
- 1 fire response vehicle bay (in accordance with DFES requirements).
- 4 PTA Staff parking bays.
- 2 PTA Servicing bays.
- 2 Kiosk tenant bays.

### 4.8 **EMERGENCY VEHICLE ACCESS**

The Yanchep Station concept design will include allowance for one emergency fire response vehicle bay within close proximity to the main station building area. The location of the bay is also required to be within a suitable distance to the fire booster cabinet, to allow connection to the fire services infrastructure.

The proposed location of the Department of Fire and Emergency Services (DFES) hardstand area is currently being finalised through the development of the Yanchep Station Fire Engineering documentation, which will enable NEWest to enter consultation with DFES to confirm the requirements.

### **ROAD SAFETY** 4.9

A pre-opening road safety audit will be required as a final check to ensure that the new roads have been adequately designed to meet relevant local design standards and to identify any safety issues which may require additional modification prior to 100% design. It is expected that all new roads will be assessed in detail, along with any new connections to the existing road network (e.g. Marmion Avenue). At this stage it would be anticipated that any issues raised in the road safety audit can be rectified with minor modifications as part of the review process, however this will likely be dependent on the specifics of the audit process.

### 5.0 CONCLUSION

NEWest has prepared this Transport Impact Assessment in order to document the Station access elements and support the Development Application submission for the proposed Yanchep Station development, as part of the wider METRONET Yanchep Rail Extension project.

This study examines the function and operation of access to and from the new Yanchep Station site, for all modes of transport. As the Yanchep Station is expected to become one of the key features of the future Yanchep City Centre, robust and accessible routes for users to connect to the site are important for the long-term success of the station and the growth of the surrounding region.

The Yanchep Station includes a 969 car bay Park & Ride facility, allowing for long term parking for public transport passengers, including the train station and bus interchange. Multiple special use bays are also provided, including motorcycle parking, electric car charging bays and PTA staff parking.

In addition to the long term parking supply, a 17-bay drop-off facility for short term (Kiss & Ride / drop-off) trips is also included within the station design. The drop-off parking area is accessed via an internal site road which is connected to the external road network through the intersection with Local Access Road 2.

The proposed Yanchep Station layout also provides for an integrated bus interchange within the station precinct, to be located immediately south east of the main Yanchep Station building. The bus interchange provides for a total of 14 active bus bays (including one articulated bay) and 7 layover bus bays (also including one articulated bay).

Accessibility for cycling and walking modes are also key aspects of the station design. A grade separated PSP connection is to be provided along the full length of the YRE rail corridor, extending from the current termination point at Butler Station through to the proposed new end of line station at Yanchep. The PSP is proposed to elevate from the below ground level of the rail corridor to the natural level of the Yanchep Station forecourt via a series of ramps, to allow for access to the station and bicycle parking facilities. The path is proposed to operate along the western side of the rail corridor with bicycle parking facilities located in close proximity to the station entry, with connections provided at key points along the network.

Additional walking and cycling connectivity is expected to be provided within the surrounding area in the years following the Station opening, as the overarching Yanchep City Centre - Activity Centre Plan No. 100 is implemented and land use within the Yanchep City Centre develops. It is anticipated that the ultimate walking and cycling network in the surrounding region will support the growth of sustainable transport modes to and from the Yanchep Station over the medium to long term timeframe.

Overall, the proposed Yanchep Station development is found to satisfy the project requirements as set out by the METRONET Yanchep Rail Extension strategy. Vehicle (including bus) access to and from the station has been demonstrated to operate satisfactorily from the opening year scenario through to the future year scenario of 2031. The Yanchep Station design supports pedestrian and cycling connectivity via the new PSP and additional future east-west connections throughout the Yanchep City Centre are expected to be added over time. Pedestrian and cycling connectivity to the existing residential areas north-west and south-west of the station, and future development within Yanchep Activity Centre, are dependent on the east-west routes and new local roads being delivered by the relevant organisations as part of the implementation of the Yanchep City Centre - Activity Centre Plan. The station will then form a central part of this future activity centre and become a catalyst for the growth and development of the surrounding region and communities.

# **STATION ACOUSTIC REPORT APPENDIX J**

# NEWest Yanchep Station Development Application Report - Acoustics

METRONET: Yanchep Railway Extension and Thornlie-Cockburn Link

# **Document Approval**

Rev	Date	Prepared by	Reviewed By	Approved by
Α	13-Aug-2020	Rachel Foster/Laura Keen	Gayle Greer	Chris Deshon
Signatu	re:	Bolon.	Gogle Gree	Clis del
Signatu	re:			
Signatu	re:			

### **Document Details**

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Revision:	A

# DETAILS OF REVISION AMENDMENTS AND PLAN TERMINOLOGY

# **Document Control**

The Acoustic Engineer is responsible for updating this plan to reflect changes as required.

# **Amendments**

Any revisions or amendments must be approved by the Design Manager before being distributed or implemented.

# **Revision Details**

Revision	Details
Α	Issued for Development Application

# **Terms and Definitions**

Term	Meaning
'A' Weighted	Frequency filter applied to measured noise levels to represent how humans hear sounds.
Ambient Sound	The all-encompassing sound at a point being a composite of sounds from near and far.
Background sound	The ambient sound in the absence of the sound under investigation.
dB	The decibel (dB) is a logarithmic unit of measurement that is commonly used to express sound pressure level. An increase of 3 dB corresponds to an approximate doubling of sound power. When applied to sound, an increase of 10dB corresponds approximately to a perceived doubling of loudness; typically 0 dB is the threshold of hearing and 120 dB is the threshold of pain.
dB(A)	'A' Weighted overall sound pressure level.
Dw	Weighted Level Difference – Single number that represents the noise reduction in sound between two adjoining enclosed spaces. It is a field measurement that relates to the R <sub>w</sub> laboratory measurement, but also includes all building elements and flanking paths and acoustic absorption in the receiving room. The result includes the actual noise reduction for the installed partition and ceiling systems. The higher the D <sub>w</sub> , the greater the noise isolation between enclosed spaces.
	$D_{\rm w}$ has superseded NIC as the Australian Standard for acoustically rating room to room noise isolation. See NIC Below.

D <sub>nC,w</sub> / CAC	Weighted Ceiling Noise Reduction Index/Ceiling Attenuation Class. This is the ability of a ceiling to prevent the transmission of sound. The $D_{\text{nC,w}}/\text{CAC}$ is a measure of sound reduction between rooms with a common ceiling plenum (or space).
D <sub>nT,w</sub>	Weighted Standardised Field Level Difference: The $D_w$ rating normalised to a standard room volume and room absorption (or reverberation time). The higher the $D_{nT,w}$ rating, the better the insulation performance.
Flanking transmission	The transmission, between two rooms sharing a common partition, of sound generated in the air of one of them via all paths except that through the common partition.
Free field	A sound field in a medium of such extent that the effects of the boundaries are negligible throughout the region of interest.
Frequency (Hz)	The human ear responds to sound in the frequency range of 20 Hertz to 20,000 Hz. A combination of sound pressure and frequency determine perceived loudness. The centre frequency of an octave is double the frequency of the lower octave. Sound measurements are usually taken at 16 one-third octave bands between 50 and 5000 Hz.
Impact sound transmission level	In a given frequency band, between two rooms situated above the other: the average octave band sound pressure level, throughout the lower room, produced by impacts delivered by a standard tapping machine to the floor of the upper room.
Intermittent noise	A noise whose sound pressure level suddenly drops to the background level several times during the period of observation, the time during which the level remains at a constant value different from that of the background level being of the order of 1s or more.
L'nT,w	The single number quantity used to characterise the impact sound insulation of floors over a range of frequencies. See BS EN ISO 140-7:1998
L <sub>10</sub>	Noise level exceeded for 10% of the measurement period. This represents the upper intrusive noise level and is often used to represent traffic/ music noise.
L <sub>90</sub>	Noise level exceeded for 90% of the measurement period. This represents the background noise level excluding nearby sources. The $L_{90}$ level is commonly referred to as the background noise level.
L <sub>eq</sub>	Energy averaged noise level over the measurement period. This measure is commonly used when comparing the criterion noise level under the Environmental Noise Regulations and for comparison with relevant standards for air conditioning noise.

# **Abbreviations and Acronyms**

Abbreviation/Acronym	Definition
AS/NZS	Australian / New Zealand Standard
NCC	National Construction Code
PA	Public Address systems
PTA	Public Transport Authority of Western Australia
SPP 5.4	State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning
SWTC	Scope of work and technical criteria
TCL	Thornlie Cockburn Link
WAEPNR	Western Australia Environmental Protection (Noise) Regulations 1997
YRE	Yanchep Rail Extension

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# 1. INTRODUCTION

The Yanchep Station is a new train station proposed to be located at the northern end of the new Yanchep Rail Extension (YRE) passenger railway line, approximately 57 km north of Perth, as indicated in Figure 1.

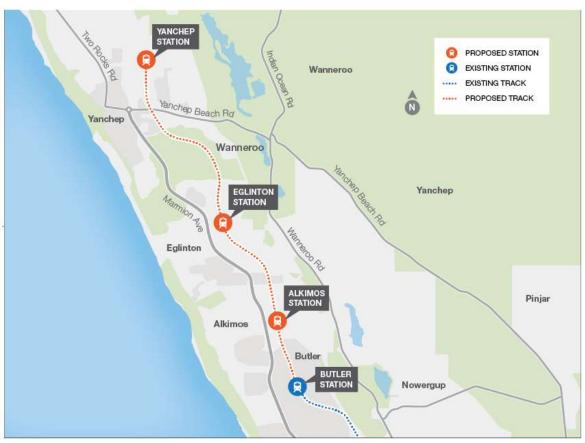


Figure 1: Proposed YRE Line

The station is to be located in the north eastern portion of the current Yanchep Town Centre. The area surrounding the station site is currently undeveloped, as indicated in Figure 3, however future development in the vicinity of the station is expect to result as the station infrastructure is established and Yanchep grows in population (depicted in Figure 3).

Extensions/modifications to existing Toreopango Avenue and St Andrews Drive, and new roads (internal precinct and connector roads) within the Yanchep Town Centre precinct are to be constructed by the adjoining developer(s).

The station will be a multi-modal interchange providing facilities for pedestrian and cycle access, local bus service interchanges, kiss-and-ride and park-and-ride passengers. Over 969 park-and-ride bays are proposed for the station, to be located on the eastern side of the station, and accessed from future Tokyu 4 Road (to the north) and Tokyu 3 Road (to the south).



Figure 2: Proposed Yanchep Station location

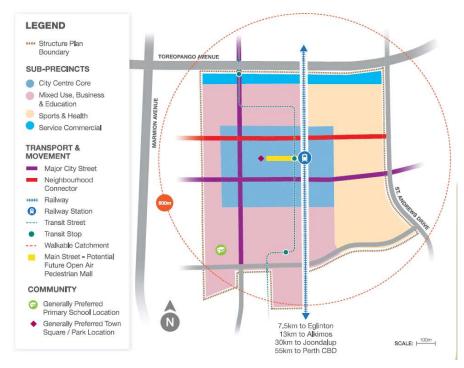


Figure 3: Proposed Yanchep Station precinct layout

# 2. ACOUSTIC ENGINEERING SCOPE

The MetroNet Design Joint Venture (DJV) is to include provision of acoustic services for the proposed Yanchep Station development. The acoustic design addresses the station, which will be comprised of a passenger platform with a concourse above, and the associated parking, connection into existing roads and bus interchange.

The key acoustic issues associated with the Yanchep Station project are:

- The control of noise intrusion into the buildings and the impacts of noise on platform areas from road traffic and mechanical plant
- The control of building services noise including mechanical plant
- Reverberation control within spaces
- Acoustic separation of dissimilar spaces
- The control of noise emission from mechanical plant to neighbouring sites
- Assessment and control of the noise from proposed car parking areas to the north of the station
- Assessment and control of the noise from the proposed bus movements.

This report sets out acoustic design criteria and the design requirements to achieve the recommended acoustic conditions associated with Development Assessment (DA) application. These are predominantly criteria for environmental noise emission from the station to adjacent noise-sensitive premises.

# 3. DESIGN CRITERIA

# 3.1 DESIGN STANDARDS AND CODES

In addition to the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria (SWTC) and the Public Transit Authority of Western Australia (PTA) specific requirements, other codes and standards required to develop the acoustic design for DA include the following:

- State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4)
- AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites
- Western Australia Environmental Protection (Noise) Regulations 1997 (WAEPNR)
- PTA Technical & Operational standards, policies and procedures.

The above list is not exhaustive but is provided to note the key guides and standards to which the design shall align.

# 3.2 NOISE IMPACTS TO SURROUNDING SENSITIVE PREMISES

# 3.2.1 BUILDING SERVICES, PA SYSTEM AND CAR PARK

The Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria states the following:

Stations and associated infrastructure (e.g. carparks, plant rooms etc) must be designed to comply with the requirements of the Environmental Protection (Noise) Regulations 1997 (WA)

Noise criteria for both steady-state and discrete noise emission from the Yanchep Station project are nominated in this section. The setting of noise emission criteria is intended to protect the acoustical amenity of nearby sensitive receivers.

Environmental noise impacts resulting from the Yanchep Station project are addressed through the Environmental Protection Act 1986 with the prescribed standards detailed in the Western Australian Environmental Protection (Noise) Regulations 1997 (WAEPNR). The regulations are based on maximum allowable noise levels termed the 'assigned noise level'. The regulations require that:

Noise emitted from any premises when received at other premises must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind

A noise emission is taken to 'significantly contribute to' a level of noise if the noise emission exceeds a value which is 5 dB below the assigned level at the point of reception.

Table 1: Assigned levels by the Western Australian Environmental Protection (Noise) Regulation 1997

Type of premises receiving	Time of Day	Environmental Emission Criterion Level dB(A)			
noise		L <sub>A,10</sub>	L <sub>A,1</sub>	L <sub>A,max</sub>	
Nearest noise sensitive receiver: highly	0700 to 1900 hours Monday to Saturday	45 + influencing factor	55 + influencing factor	65 + influencing factor	
sensitive area	0900 to 1900 hours Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor	
	1900 to 2200 hours all days	40 + influencing factor	50 + influencing factor	55 + influencing factor	
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor	
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80	
Commercial Premises	All hours	60	75	80	
Industrial premises	All hours	65	80	90	

The regulations also apply penalties on noise levels that contain annoying characteristics such as tonal components. Where these characteristics do exist and cannot be practicably removed, then the measured levels are adjusted according to the penalties as follows:

- Where tonality is present: +5 dB
- Where modulation is present: +5 dB
- Where impulsiveness is present: +10 dB.

The noise adjustments apply up to a maximum cumulative total of 15 dB.

The influencing factor is applied to account for higher noise areas as a result of nearby industrial and commercial areas and major roads. The influencing factor is determined by considering the land use within two circles having a radius of 100 m and 450 m from the noise sensitive premises of concern and proximity to major and minor roads as defined in the WAEPNR. The nearest noise sensitive receivers on each side of the Yanchep Station project have been identified as shown in Figure 4 and are summarised in Table 2 below.

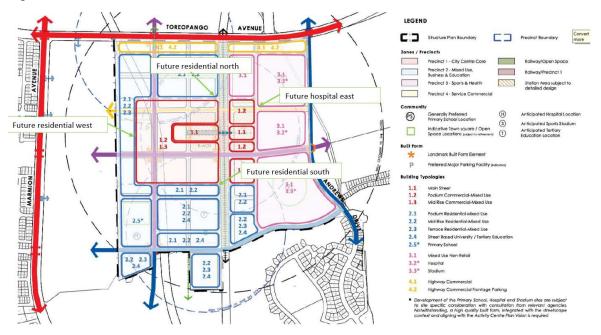


Figure 4: Nearest noise-sensitive receiver locations

Table 2: Nearest noise-sensitive receiver locations

Location	Noise Sensitive Receiver	Receptor Type
North	Future Development	Residential
East	Future Development	Health
South	Future Development	Residential
West	Future Development	Residential

Note: Selection of noise sensitive premises is based on Schedule 1 - Part C of the WAEPNR

Transport factors of 6 dB(A) and 2 dB(A) are applied to noise sensitive receivers if major roads are located within 100 m and 450 m respectively. A transport factor of 2 dB(A) is applied to noise sensitive receivers if a secondary road is located within 100 m of a noise-sensitive receiver.

A major road is defined as having vehicle traffic flows in excess of 15,000 vehicles per day. A secondary road is defined as having traffic flows of 6,000 to 15,000 vehicles per day.

The major roads and secondary roads within 100 m and 450 m of the noise-sensitive receivers are identified in the NEWest traffic assessment report shown in Figure 5 and given in Table 3 below.



Source: Yanchep Activity Centre Structure Plan - Integrated Transport Network Strategy (Jacobs, January 2015)

Figure 5: Future traffic volumes adjacent Yanchep Station

Table 3: Major/secondary roads adjacent to Yanchep Station

Location	Major road within 100 m	Secondary road within 100 m	Major road within 450 m
North – residential	-	Future road: precinct internal north-south	Marmion Avenue, future Toreopango Avenue
East – health	-	-	Marmion Avenue, future Toreopango Avenue
South – residential	-	Future road: precinct internal east-west	Marmion Avenue, future Toreopango Avenue
West - residential	Marmion Avenue	Future roads: precinct internal north-south; precinct internal east-west	Marmion Avenue, future Toreopango Avenue

The area surrounding the Yanchep Station is currently greenfield space. The zoning identified in Figure 4 and the zoning plan for the City of Wanneroo have been used to identify the future zoning around the station. To determine the influencing factor, existing/proposed future roads and future land uses have been utilised. The influencing factors at the nearest noise sensitive receivers are summarised below.

Table 4: Environmental Design Criteria – Influencing Factor

Location	% Industrial Area Use		% Commercial Area Use		Transport Factor	Influencing Factor
	100 m	450 m	100 m	450 m		
North – residential	16%	9%	34%	12%	4 dB(A)	9 dB(A)
East – health	4.5%	5.5%	21.5%	12%	2 dB(A)	5 dB(A)
South – residential	15.5%	6.5%	34%	12%	4 dB(A)	8 dB(A)
West - residential	0%	5%	45.5%	11.5%	6 dB(A)	9 dB(A)

The assigned levels are adjusted by the calculated influencing factors to result in the overall noise emission criteria for the area.

Table 5: Environmental Design Criteria – Yanchep Station Assigned Noise Levels, dB(A)

Type of premises	Time of Day	Environmental Emission Criterion Level dB(A)		
receiving noise		L <sub>A,10</sub>	L <sub>A,1</sub>	L <sub>A,max</sub>
North – residential	0700 to 1900 hours Monday to Saturday	54	64	74
	0900 to 1900 hours Sunday and public holidays	49	59	74
	1900 to 2200 hours all days	49	59	64
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	44	54	64
East – health	0700 to 1900 hours Monday to Saturday	50	60	70
	0900 to 1900 hours Sunday and public holidays	45	55	70
	1900 to 2200 hours all days	45	55	60
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	40	50	60

	T. T	T. C.		
South – residential	0700 to 1900 hours Monday to Saturday	53	63	73
	0900 to 1900 hours Sunday and public holidays	48	58	73
	1900 to 2200 hours all days	48	58	63
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	43	53	63
West – residential	0700 to 1900 hours Monday to Saturday	54	64	74
	0900 to 1900 hours Sunday and public holidays	49	59	74
	1900 to 2200 hours all days	49	59	64
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	44	54	64
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial premises	All hours	65	80	90

# Notes:

It is noted that the WAEPNR does not specifically identify that the above environmental noise criteria are applicable to noise from rail passengers and patrons of the Yanchep Station; however, an assessment is made here to quantify the likely impacts of these sources to adjacent noise-sensitive receivers.

<sup>1.</sup> A noise emission from a premises is considered to not significantly contribute to the noise at a receiver if the noise emission is 5 dB below the overall noise emission criteria for the area.

# 3.2.2 STATION ENTRY ROADS AND BUS MOVEMENTS

The Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria states the following:

The Alliance must design roads works and any associated noise mitigation controls to meet the requirements of Western Australia State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning.

Table 6: Environmental Design Criteria - New and Upgraded Public Roads and Bus Lanes

Type of premises receiving noise	Time of Day	New Road	Upgraded Road
Noise-sensitive land	Day (6 am-10 pm)	L <sub>Aeq</sub> (Day) = 55 dB(A)	L <sub>Aeq</sub> (Day) = 60 dB(A)
use (existing and planned development)	Night (10 pm–6 am)	$L_{Aeq}$ (Night) = 50 dB(A)	L <sub>Aeq</sub> (Night) = 55 dB(A)

It is noted that the internal precinct roads such as Tokyu3 and Tokyu4 Road (amongst others) and the southern precinct connector road, as well as extensions/modifications to existing Toreopango Avenue and St Andrews Drive, are independent of the MetroNet scope of works and the potential impact from these to noise-sensitive receivers is to be assessed and managed by the developers of those roads, and is not covered by this assessment.

It is also noted that the assessment of rail noise to adjacent noise-sensitive receivers is being addressed separately for the MetroNet project, and does not form part of this scope.

# 3.3 CONSTRUCTION NOISE AND VIBRATION

The WAEPNR clarifies that the environmental noise criteria outlined in Table 5 are not applicable to noise emitted from a construction site where works are carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday if it shown that the construction works are generally carried out in accordance with the control of Section 4 of AS 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites* and if construction work is carried out in accordance with an approved management plan.

It is noted that a specific construction noise and vibration management plan is being addressed separately for the MetroNet project, which will include relevant site clearing and construction works associated with the Yanchep Station, and does not form part of this scope.

# 4. ACOUSTIC DESIGN ELEMENTS

# 4.1 STATION IMPACTS TO SURROUNDING SENSITIVE PREMISES

### 4.1.1 BUILDING SERVICES

Mechanical services plant selections for the Yanchep Station have not been determined at this stage, however, will likely comprise:

- Small exhaust fans to ablution facilities and electrical plant spaces
- Small outside air intake fans to mechanical plant spaces
- Condensing units to serve split air conditioning
- Critical cooling to comms spaces

- Air conditioning to occupied spaces (crib room, offices) incorporating split systems with wallmounted indoor units
- Two transformers as follows:
  - 1x 630 kVA precinct mains supply transformer 66 dB(A) Sound Power Level
  - 1x 500 kVA station isolation transformer 62 dB(A) Sound Power Level.

The anticipated equipment and locations are as shown in Figure 6.

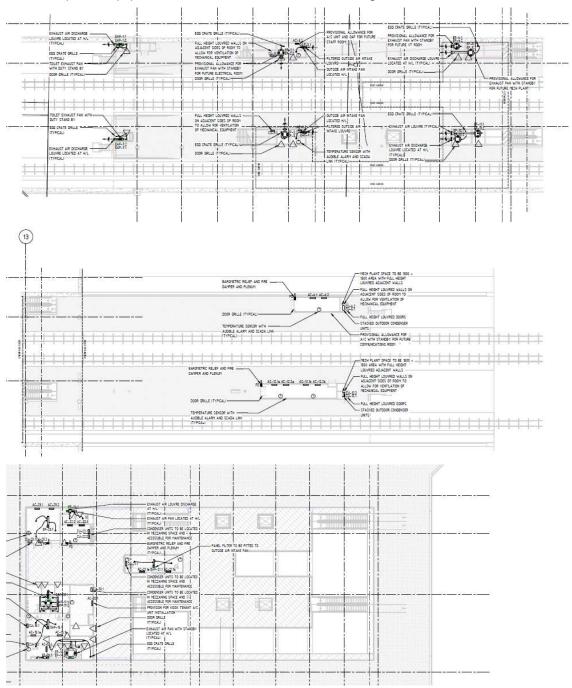


Figure 6: Proposed Yanchep Station building services

It is expected that standard noise control measures will be sufficient to control mechanical services plant noise in order to meet the required environmental noise levels at adjacent noise-sensitive areas. Such measures include:

- Selection of quietest possible equipment
- Internal duct lining (where appropriate)
- Appropriate location of equipment away from adjoining noise-sensitive receivers (including taking advantage of shielding afforded by the station itself)
- Acoustic louvres where appropriate
- Enclosure of transformers.

### 4.1.2 PUBLIC ADDRESS SYSTEM

The design of the public address system design will be developed during the next stage of the design development to meet the environmental noise criteria outlined in Section 3.2.1.

Preliminary calculations suggest that a maximum combined sound power level of all PA speakers of approximately 86 dB(A) would achieve the environmental noise criteria at all noise-sensitive receivers.

### 4.1.3 CAR PARK

The car parking associated with the Yanchep Station is proposed to have a maximum capacity of over 969 bays. Based on the 2031 traffic generation of 472 cars accessing car park 1 and 2 during the morning peak hour, the predicted noise levels from the car park alone at the nearest noise-sensitive receptors are as follows:

	North - residential	36 dB(A)
•	East – health	39 dB(A)
•	South – residential	28 dB(A)
	West – residential	26 dB(A).

It is noted that these estimated car park noise levels do not take into account any acoustic barriers which the developer may be required to construct as conditioned on the development of the land within the Yanchep precinct. It is unknown at the time of writing as to the location and/or extent and/or heights of any such barriers. The influence of these can be addressed when this is clarified.

Nevertheless, the environmental noise criteria identified in Table 5 are predicted to be achieved without any potential influence from any such barriers, and therefore noise from the Yanchep Station car park is not expected to cause disturbance to the nearby noise-sensitive receivers.

### 4.1.4 PASSENGER NOISE

The station is anticipated to have around 8,616 passengers per day by 2031. The highest passenger volume is expected during the morning peak hour period, with approximately 2,839 boardings and alightings. For YRE, the peak 15-minute period has 36% of the peak one-hour demand i.e. 1,022 boardings and alightings, meaning around 1,022 passengers on the station platform for a 15-minute period.

On the basis that the gender split is 50%/50%, and that half the passengers would be speaking in normal voices at any one point in time, the predicted noise levels from passengers at the nearest noise-sensitive receptors are as follows:

	North - residential	40 dB(A)
•	East – health	48 dB(A)
•	South – residential	46 dB(A)
•	West – residential	39 dB(A).

These predicted noise levels are below the day-time environmental noise criteria at the identified receiver locations, and therefore noise from passengers on the Yanchep Station platform is not expected to cause disturbance to the nearby noise-sensitive receivers.

# 4.2 ROAD AND BUS MOVEMENT IMPACTS TO SURROUNDING SENSITIVE PREMISES

The connection road between the proposed new car park and the future local north-south internal precinct road Road, the associated car park vehicles using this road and connecting to the future Tokyu 3 and Tokyu 4 roads, as well as the bus movements along the internal station area, are required to be assessed against the road traffic requirements of the SPP 5.4.

The following inputs to the road and bus noise assessment have been taken from the transport planning report *NEWest Yanchep Station Transport Assessment Draft Rev A 14-07-20*:

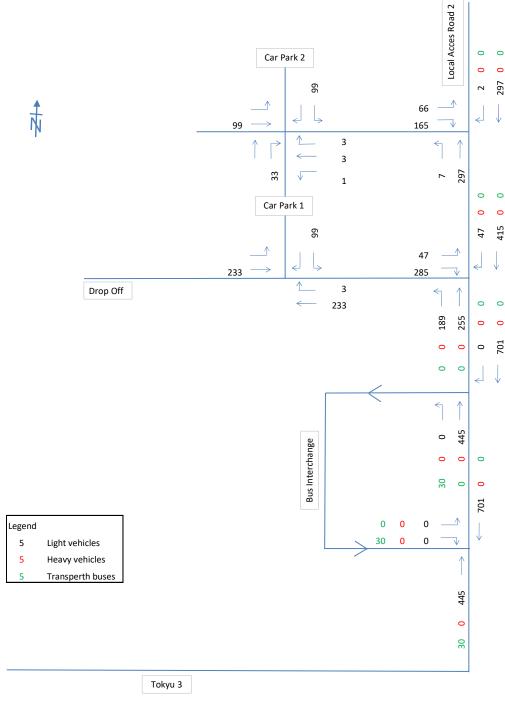


Figure 7: Proposed Yanchep Station peak hour traffic movements

Approximately 96% of vehicle movements occurring during the daytime period.

On the basis of these movements, the predicted vehicle movement noise levels associated with the station precinct are as follows:

	North – residential	$L_{Aeq (Day)}$ 53 dB(A), $L_{Aeq (Night)}$ 43 dB(A)
	East - health	L <sub>Aeq (Day)</sub> 57 dB(A), L <sub>Aeq (Night)</sub> 45 dB(A)
•	South – residential	$L_{Aeq (Day)}$ 58 dB(A), $L_{Aeq (Night)}$ 50 dB(A)
	West – residential	L <sub>Aeq (Day)</sub> 45 dB(A), L <sub>Aeq (Night)</sub> 35 dB(A).

Therefore, the road traffic noise criterion of  $L_{Aeq (Day)}$  55 dB(A) is expected to be slightly exceeded at the nearest noise-sensitive receivers to the east and south of the Yanchep Station.

However, for these selected worst-case receiver locations (refer Figure 4), it is noted that the following are to also to be taken into account:

- These traffic noise levels should be considered in the context of the likely traffic noise levels anticipated as a result of the complete traffic noise environment associated with the entire development precinct. With traffic volumes (as shown in Figure 5) of greater than 20,000 vpd on Marmion Avenue and Toreopango Avenue, 10,000 15,000 vpd on the proposed north-south internal precinct road, and 5,000 12,000 vpd on the proposed east-west internal roads and St Andrews Drive, traffic noise levels from the station vehicle movements alone is expected to be in the order of 3 dB lower than noise levels from traffic on the wider road network. Therefore, traffic noise associated with the station would be indistinguishable from normal traffic noise in the area.
- The selected receiver location to the east of the Yanchep Station is proposed to be a health development/hospital. It would be reasonable to expect that the design of such a building would provide mitigation to external noise levels to enable an appropriate level of internal noise level to be achieved.
- The selected worst-case receiver location to the south of the Yanchep Station has been hypothetically set as being immediately adjacent to the railway. It is likely that the development will require some form of offset for those residences nearest to the transport elements, and therefore the actual worst-case receiver location may be further from the road than as estimated here.
- It is also noted that modern building constructions (such as identified in Table 3 of the SPP 5.4 Implementation Guidelines) would enable an appropriate level of internal noise levels within occupied spaces of such a residence.
- The SWTC Book 3 Part A section 9.1.1.8 states the following:

9.1.1.8	The Alliance must undertake the design and construction of the following structures:	
i.	retaining walls;	
ii.	support structures for rail system infrastructure, including OLE, Traction Power, Signalling and Communications equipment;	
iii.	cable containment structures;	
iv.	structures for new services crossings and protection of existing services; and	
v.	noise wall structures: noise wall design and construction only required where development is already adjacent to the rail corridor.	

Therefore, as the land on which these worst-case receiver locations is located has not yet been developed, it is the onus of the developer to undertake mitigation measures to ensure appropriate noise levels within its development boundaries.

# **APPENDIX K BUSHFIRE ASSESSMENT**



NEWest Alliance Bushfire Attack Level (BAL) Contour Assessment Report

Yanchep Station

13 August 2020

59400/131,574 (Rev 0)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G



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# **Appendices**

Appendix A Development plan

Appendix B Vegetation plot photos and description



# 1. Background

# 1.1 Purpose of report

This Bushfire Attack Level (BAL) contour assessment report has been prepared to determine the level of BAL impact applicable to the Yanchep Station site (hereon referred to as the project area) based on the current vegetation conditions observed during the site inspection and consideration of the proposed Yanchep Station development footprint (refer to Appendix A).

This report is not a Bushfire Management Plan (BMP), but rather serves to inform:

- the level of BAL exposure across the site
- whether any subsequent design modifications are required as part of proposed development to achieve compliant bushfire outcomes
- the level of bushfire reporting required to accompany the Development Application (DA) process.

The project area is designated as bushfire prone on the Map of Bush Fire Prone Areas (DFES 2020, see Plate 1). As such, bushfire risk considerations and BAL assessment at the planning (DA) stage are required to be formally addressed, unless the proposed development is exempt under relevant provisions of *Planning Bulletin 111/2016 Planning in Bushfire Prone Areas* (e.g. for non-habitable development).

# 1.2 Site/development summary

Table 1 provides a summary of the subject site and proposed development. For the purposes of producing a BAL contour map, the project area in this BAL contour assessment report is consistent with the external boundary of the DA footprint (see Figure 1).

Table 1: Site/development summary

Site details				
Address details	146K Toreopango Avenue			
	Yanchep, WA 6035			
Local government area	City of Wanneroo			
Description of proposed works	Proposed Yanchep Station comprising:			
	station building (habitable building)			
	canopy and platform			
	busway (habitable building)			
	• roads			
	rail track			
	• carpark.			





Plate 1: Map of Bush Fire Prone Areas (DFES 2020)



# 2. Bushfire assessment results

# 2.1 Assessment inputs

# 2.1.1 Vegetation classification

Strategen-JBS&G assessed classified vegetation and exclusions within the 150 m assessment area through on-ground verification on 5 August 2020 in accordance with AS 3959—2018 Construction of Buildings in Bushfire-Prone Areas (AS 3959; SA 2018) and the Visual Guide for Bushfire Risk Assessment in Western Australia (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix B and depicted in Figure 1.

Site observations indicate that classified vegetation within the 150 m assessment area consists of shrubland and scrub vegetation, including:

- Class C shrubland to the northeast, southwest, south and east of the project area
- Class D scrub surrounding the project area in all directions.

Existing areas excluded from classification within the 150 m assessment area include mineral earth tracks excluded under Clause 2.2.3.2 (e).

The proposed development will require modification (clearing) of all vegetation within the project area and Yanchep Rail Extension envelope and management to achieve exclusion under Clauses 2.2.3.2 (e) and (f). Broader development works adjacent to the project area to construct a new railway track within the Yanchep Rail Extension envelope (see Figure 1) will result in additional vegetation within the railway reserve either being removed or modified to a low threat state as per the following ongoing management regime:

- removal of all dead vegetation
- uplift of any trees
- brush cut/mow grass/weeds between fences and road verges
- removal of any vegetation inside the rail reserve that is a hazard or the potential to become one within 6 m of the closest rail
- maintenance of a 3 m wide firebreak, with an additional horizontal clearance of 0.5 m on both sides and a vertical clearance of 4 m established within the rail reserve against the reserve fencing.

On this basis, any vegetation within the rail reserve will be excluded under Clause 2.2.3.2 (f) and existing cleared areas will remain excluded under Clause 2.2.3.2. (e).

## 2.1.2 Effective slope

Strategen-JBS&G assessed effective slope under classified vegetation within the 150 m assessment area through on-ground verification on 5 August 2020 in accordance with AS 3959. Results were cross-referenced with DPIRD 2m contour data and are depicted in Figure 1.

Site observations indicate that the project area and surrounding 150 m of land are situated on undulating terrain, with variation in slope beneath classified vegetation ranging from flat/upslope to 15 degrees downslope in relation to the project area. On this basis, Strategen-JBS&G has assigned effective slopes accordingly, ranging from flat/upslope to downslope >10-15 degrees for the various classified vegetation plots.



# 2.1.3 Summary of inputs

Figure 1 illustrates the anticipated post-development vegetation classifications, effective slopes and exclusions following completion of development works. These inputs are summarised in Table 2.

Table 2: Summary of vegetation classifications, exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class C Shrubland	Flat/upslope (0°)	Shrubland vegetation dominated by acacia species less than 2 m in height with a continuous vertical fuel profile.
2	Class D Scrub	Flat/upslope (0°)	Scrub vegetation predominantly 2-6 m in
3	Class D Scrub	Downslope >0–5°	height, dominated by acacia and banksia
4	Class D Scrub	Downslope >10–15°	species.
5	Class D Scrub	Flat/upslope (0°)	
6	Class D Scrub	Downslope >0–5°	
7	Class C Shrubland	Downslope >10–15°	Shrubland vegetation dominated by acacia species less than 2 m in height with a continuous vertical fuel profile.
8	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Area to be modified to a low threat state as part of proposed development.
9	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Non-vegetated areas (i.e. mineral earth firebreaks, service tracks).





# 2.2 Assessment outputs

# 2.2.1 Bushfire Attack Level (BAL) contour assessment

Strategen-JBS&G has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for the project area. The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation classification
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by future development areas and subsequently informs the standard of building construction and/or setbacks required for any proposed habitable development to potentially withstand such impacts and/or comply with relevant bushfire planning requirements.

The indicative post-development BAL contours are based on the following assumptions:

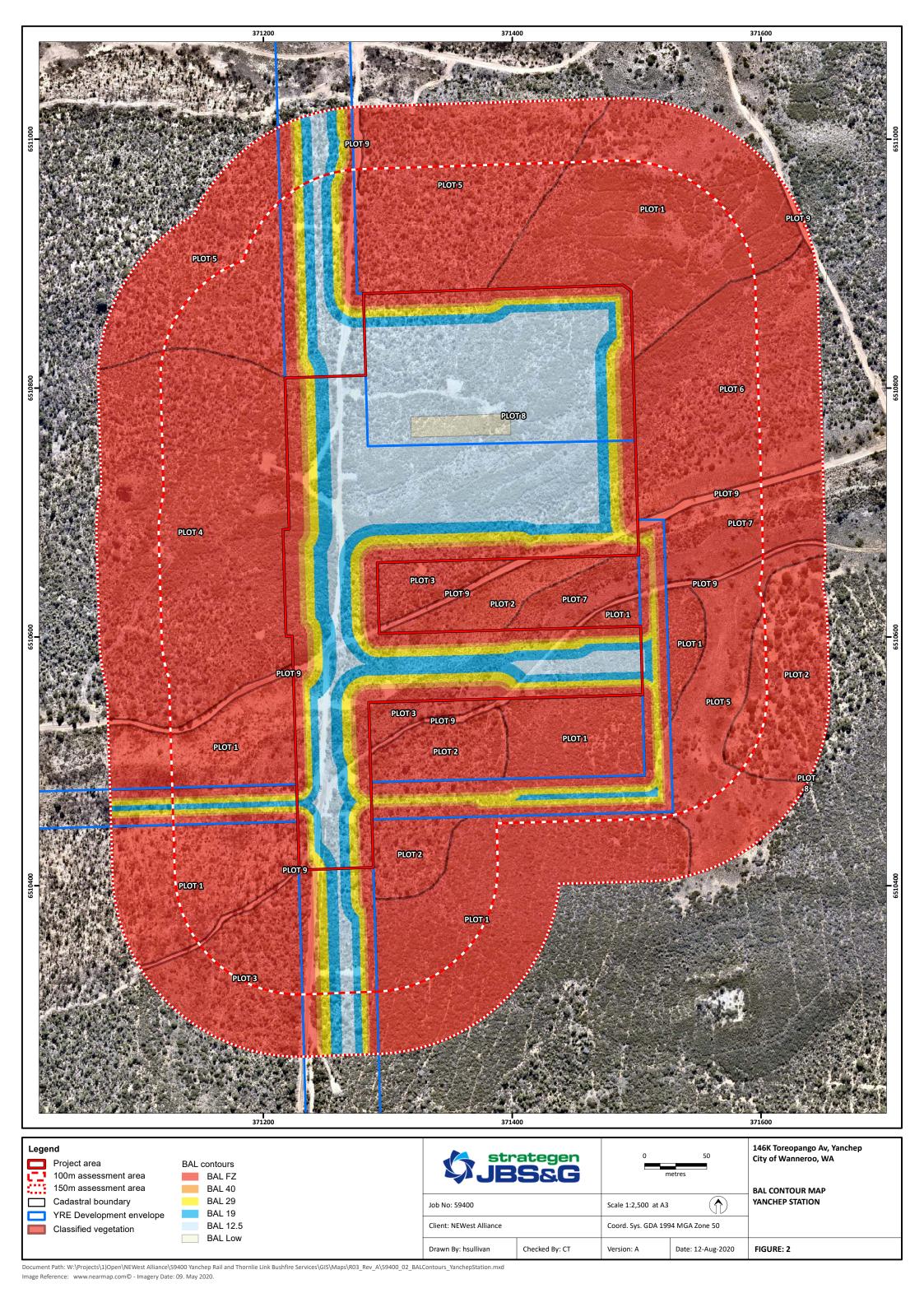
- the vegetation classifications and effective slope observed at the time of inspection
- the entire project area and broader Yanchep Rail Extension envelope being modified to a low threat state as part of proposed development and managed in a low threat state to achieve exclusion under Clauses 2.2.3.2 (e) and (f).

Results of the BAL contour assessment are detailed in Table 3 and illustrated in Figure 2.

The highest BAL applicable to the project area boundary is BAL-FZ.

Table 3: BAL contour assessment results

Method 1 BAL determination					
Vegetation plot Vegetation classification		Effective slope	BAL contour width	Highest BAL to project area boundary	
1	Class C Shrubland	Flat/upslope (0°)	<7m	BAL-FZ	
2	Class D Scrub	Flat/upslope (0°)	<10m	BAL-FZ	
3	Class D Scrub	Downslope >0–5°	<11m	BAL-FZ	
4	Class D Scrub	Downslope >10-15°	<14m	BAL-FZ	
5	Class G Grassland	Flat/upslope (0°)	<6m	BAL-FZ	
6	Class D Scrub	Downslope >0–5°	<11m	BAL-FZ	
7	Class C Shrubland	Downslope >10-15°	<9m	BAL-FZ	
8	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	
9	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	





# 3. Conclusion and recommendations

Assessment results are based on post-development site conditions, including establishment and ongoing maintenance of the entire project area and broader Yanchep Rail Extension envelope to a non-vegetated/low threat state.

The project area contains proposed habitable development located within a designated bush fire prone area that is subject to a BAL rating above BAL-Low. On this basis, Strategen-JBS&G considers that the proposed development is required to comply with the relevant requirements under *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015) and the associated *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2017). Therefore, a BMP will be required to accompany the Yanchep Station DA to demonstrate the necessary bushfire compliance measures in accordance with the abovementioned policy and guidelines.



# 4. References

- Department of Fire and Emergency Services (DFES) 2020, Map of Bush Fire Prone Areas, [Online], Government of Western Australia, available from: https://maps.slip.wa.gov.au/landgate/bushfireprone/, [11/08/2020].
- Department of Planning (DoP) 2016, Visual guide for bushfire risk assessment in Western Australia, Department of Planning, Perth.
- Standards Australia (SA) 2018, Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas, Standards Australia, Sydney.
- Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire Prone Areas*, Version 1.3 August 2017, Western Australian Planning Commission, Perth.



# 5. Limitations

# Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

# **Environmental conclusions**

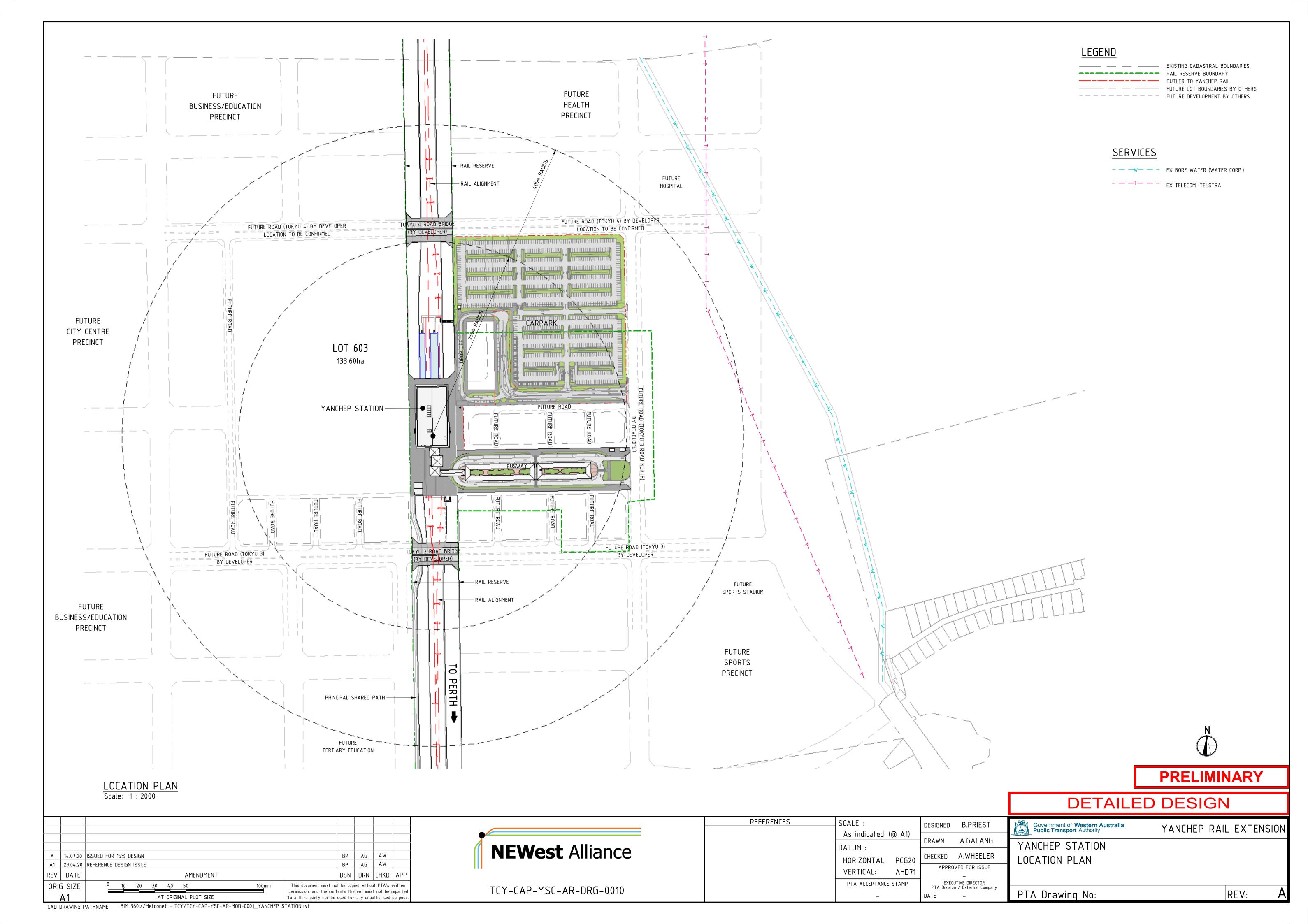
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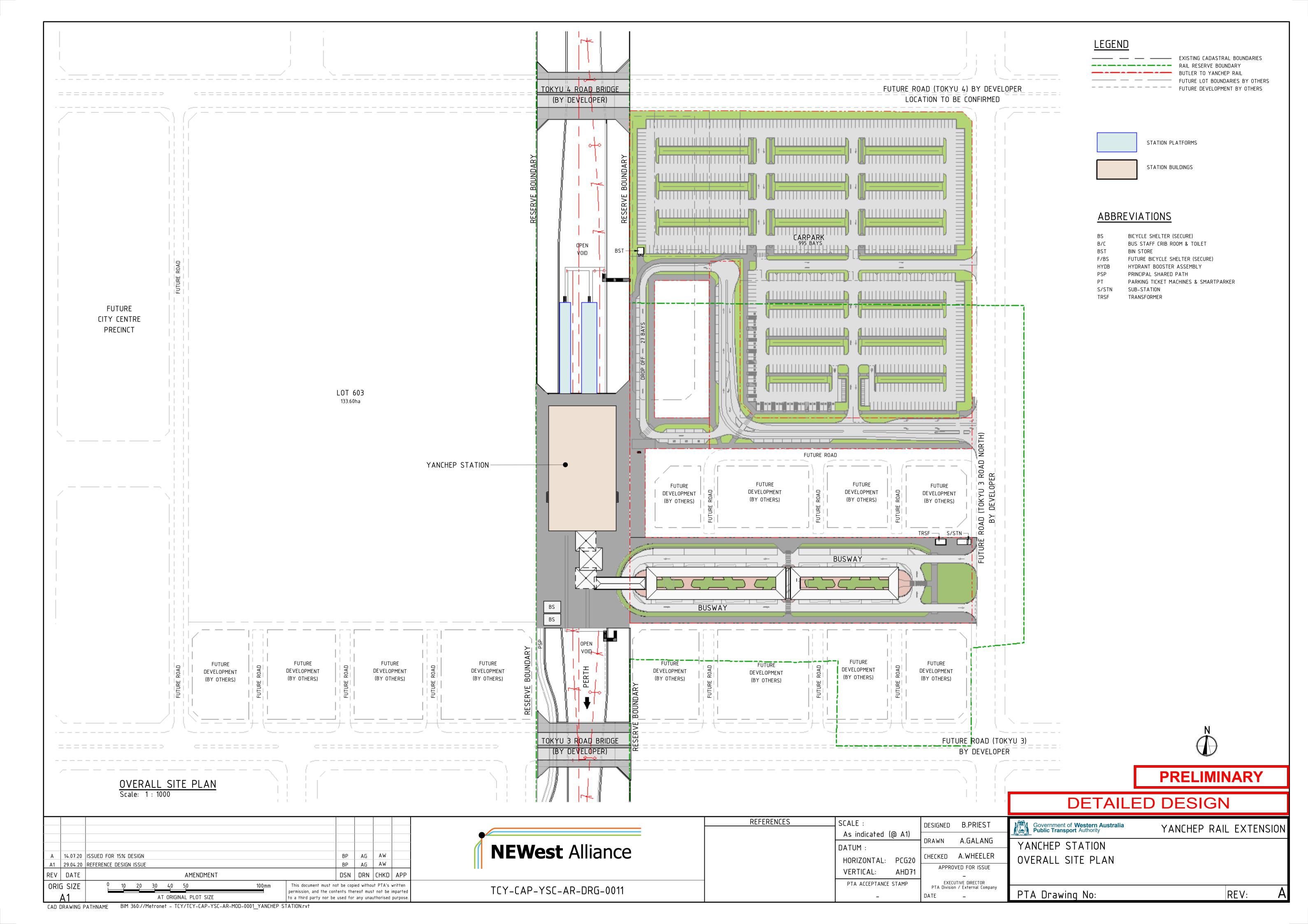
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# Appendix A Development plan







# Appendix B Vegetation plot photos and description



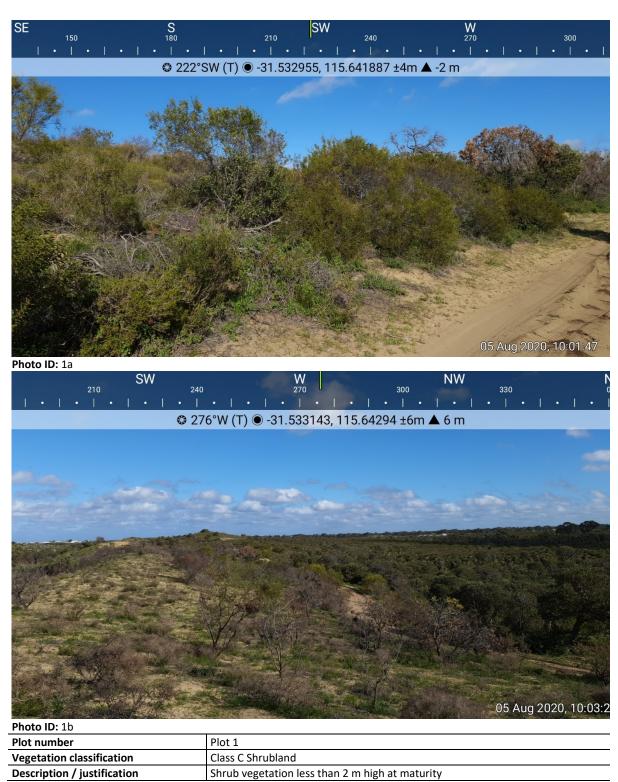






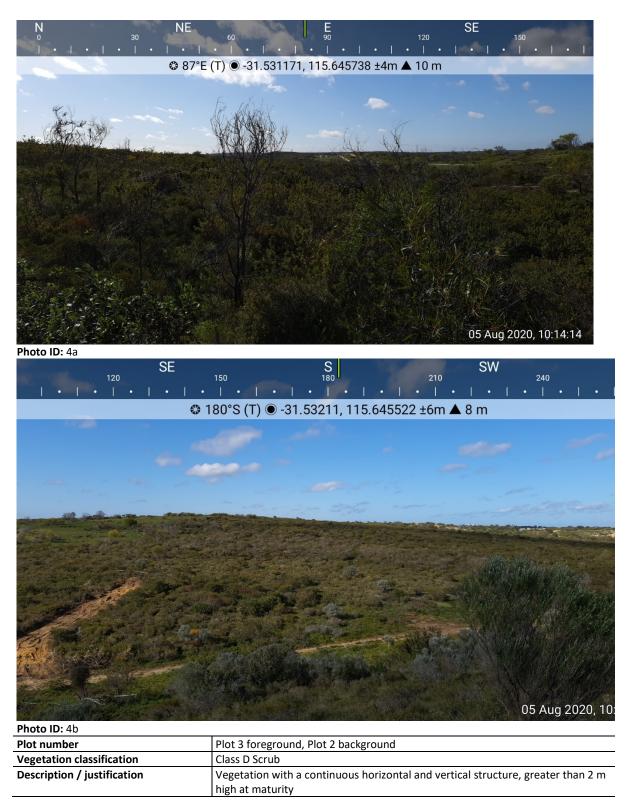
Photo I	I <b>D</b> : 2a
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Plot number	Plot 4
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m
	high at maturity















05 Aug 2020, 10:23:17



Photo ID: 6b

Plot number	Plot 4	
Vegetation classification	Class D Scrub	
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m	
	high at maturity	



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# **Document Status**

Report	Rev No.	Purpose	Author	Reviewed and Approved for Issue	
version				Name	Date
Final Report	Rev 0	Issued for use: to inform development design and confirm BMP requirements	Brodie Mastrangelo (BPAD 45985, Level 1)	Zac Cockerill (BPAD 37803, Level 2)	13 August 2020

# **APPENDIX L SUMMARY OF YRE ENVIRONMENTAL MANAGEMENT STRATEGIES**

# YRE Environmental Strategies Summary Statement for DA Planning Reports

DRAFT 1.0, 12 Aug 20

The new YRE passenger rail line will travel through existing and planned developments, meaning that minimising environmental and community impacts during its construction is a key focus. While a new railway is itself a sustainability initiative, construction of such major public transport infrastructure is overseen by a raft of both environmental and public health requirements - governing hours of work, the management of noise, vibration and dust, and the need to working together with communities in developing measures that will minimise impacts.

## Flora and Fauna

As sections of the project footprint is located in greenfield sites, clearing will be required for the new passenger line. As outlined above, all vegetation clearing has received approval under the *Environmental Protection Act 1986*. The design has been optimised to limit the clearing to only that required to safely construct the permanent footprint.

The project footprint has been adjusted where possible to avoid significant ecological communities. Where this could not be achieved, significant areas of offset vegetation have been obtained offsite and funds allocated to manage those environmental offsets in perpetuity.

Prior to clearing, a trapping and relocation program will be undertaken by a qualified ecologist. Native animals will be relocated to nearby suitable habitat, as approved by the Department of Biodiversity, Conservation and Attractions.

To ensure animals free movement across the rail corridor, and to maintain the ecological link and habitat through these areas, the project will build one fauna underpass through the Alkimos Parks and Recreation Reserve. Three fauna bridges will also be constructed in the Ningana Bush Forever area, and will be 30m wide, span 22m, have nearly 1m of soil hosting vegetation similar to surrounding vegetation.

# **Environmental Controls**

There are numerous controls in place throughout different stages of the project to mitigate impact on both flora and fauna. A combination of legislative, planning and construction controls, and monitoring govern the project with the aim to protect the environment through all stages of delivery. These controls include:

- monitoring of dust, noise and vibration during construction
- marking the clearing boundary by surveyors prior to the start of clearing
- fauna trapping and relocation prior to clearing, and the presence of fauna spotters during clearing
- · endeavouring to schedule noisy activities at less sensitive times
- barricading and signage to clearly outline 'no-go' areas
- engaging with local stakeholders and the community
- adhering to required regulatory legislative approvals and associated conditions
- environmental monitoring, inspections and audits to confirm compliance with approvals and legislation

 environmental training incorporated into induction for all personnel, subcontractors and visitors to site.

Controls will be inspected regularly throughout the project duration to ensure their ongoing suitability and effectiveness.

# **Revegetation and Landscaping**

All areas disturbed by the construction process that are not part of the permanent infrastructure will be revegetated as part of a landscape design produced by a landscape architect. The landscape design will provide quality landscape and urban design solutions which integrate the rail development and station precincts with the surrounding natural areas.

Revegetation and landscaping measures will include some or all of the following measures:

- reuse of topsoil from clearing during revegetation and landscaping
- maintenance of the required groundwater hydrology where needed to support existing vegetation and habitats in sensitive areas
- application of mulch to revegetated and landscaped areas to improve vegetation success
- stabilise the rail corridor walls with planting of locally species where possible
- retention of vegetation where not impacted by earthworks and not posing a safety risk.

# **Managing Noise, Vibration and Light**

The project is committed to minimising construction noise and vibration along the alignment as much as possible by utilising various controls including limiting noisy works outside of normal working hours, where practicable and using construction techniques and work practices that generate lower noise levels.

Where out of hours works are required, they will be undertaken in accordance with a Noise and Vibration Management Plan approved by the City of Wanneroo. This plan will outline additional controls and community notification requirements.

To minimise impacts on the proposed residential developments nearby, the majority of the YRE line will be built in a cutting, with developers required to have appropriate setbacks from the rail reserve (via road reserves or public open space) and homes in the 'first row' facing the route encouraged to implement 'quiet house design'.

To manage vibration from passing trains, ballast matting (matting that sits in the rail formation) will be installed under the rail where it is located next to existing and future residential developments. This matting absorbs vibrations made by the train.

Noise walls will also be used in existing residential developments to assist with noise mitigation for residents living near to the trainline. The project team is currently confirming the height, materials and location of the noise walls along the alignment.

NEWest Alliance Page 2 2

# **APPENDIX M**

# **YRE CONSTRUCTION PROGRAM SUMMARY**

# YRE Construction Program Summary Statement for DA Planning Reports

DRAFT 2.0, 12 Aug 20

# **Construction Program and Management**

# **Overview of Yanchep Rail Extension**

The Yanchep Rail Extension (YRE) is the extension of Public Transport Authority (PTA's) passenger rail network. In conjunction with the state government's METRONET initiative, the 14.5 Kilometre distance is an extension from Butler Station and provides new stations at Alkimos, Eglinton and Yanchep and in addition, nine new road-over-rail bridges.

YRE stations are typically greenfield construction with challenges including:

- Butler Station removal of existing crossover, future Alkimos Drive inclusive with a bridge construction(s); Santorini Bridge, LWP2 Bridge, Romeo Bridge and Alkimos Drive Bridge.
- Alkimos Station Alkimos Drive to Pipidinny Road Bainbridge Ave to the south of Pipidinny road, Pipidinny Road Bridge;
- Eglinton Station Pipidinny Road to the south of Yanchep Beach Road, the south of Yanchep Beach Road to the existing Yanchep Beach Road, Yanchep Beach Road Bridge; and
- Yanchep Station delivery to the end of track alignment inclusive of Tokyu 3 Road Bridge, Toropango Ave Bridge.

# **Construction Management Planning**

Each development site will be required to have a Construction Management Plan (CMP) endorsed prior to site mobilisation. The CMP will be supported by a range of other management plans (e.g. Traffic Management Plan), which will be prepared in consultation with the local government and other relevant agencies, based on the range of risks needing to be managed at each development site. Each CMP will provide the overarching framework and direction for all construction related works and activities on site during the station's construction phase. The CMP set outs the NEWest Alliance's construction methodology for this multi-disciplinary project and:

- complies with the PTA's Scope of Works and Technical Criteria (SWTC) and associated Project Specific Requirements (PSRs) and objectives;
- provides appropriate consideration to working in a constrained urban and existing rail environment;
- identifies, mitigates or effectively manages all interfaces and associated risks;
- ensures a respectful and considered approach to construction that minimises disruption to the
  existing PTA network, community and other stakeholders (e.g. road closures, working after
  hours, etc.);
- ensures delivery phase activities are undertaken in a clear, structured, methodical manner with 'no surprises';
- achieves desired functionality, safety, quality and program requirements in an environmentally and community sensitive manner; and
- details the management strategies and practices for construction at each site, excluding construction relating to rail and rail systems.

The preparation of each station development site CMP will be informed by the endorsed Construction Plan YRE document. This provides the overarching framework and direction for all construction related activities and works during the delivery phase of the METRONET Stage 1 Initiatives: Yanchep Rail Extension.

# **Station Construction Site Layout**

The sketch shown in Figure demonstrates the planned approach for site set up at new stations and notes locations for the set-up of mobile cranes and concrete pumps.

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Figure ?: Typical site layout for a YRE station development project.

# **Timeframes for Construction and Day One Operations**

The NEWest Alliance has taken a risk based approach on design to ensure accurate and efficient project delivery deadlines. The key construction milestones are as follows:

Table ?: YRE wide key construction milestones.

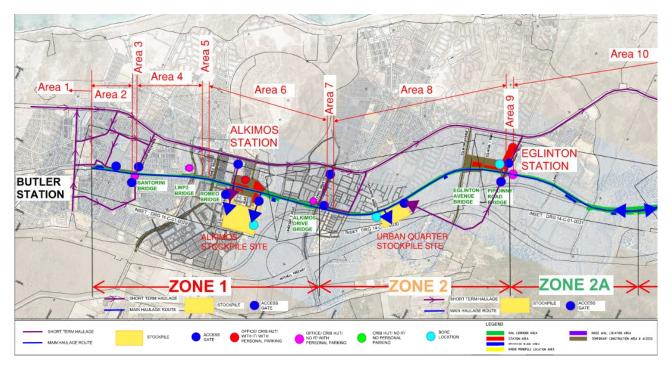
Milestone	Target Completion Date	
Design Complete	06 April 2021	
Civil Works Complete	23 December 2021	

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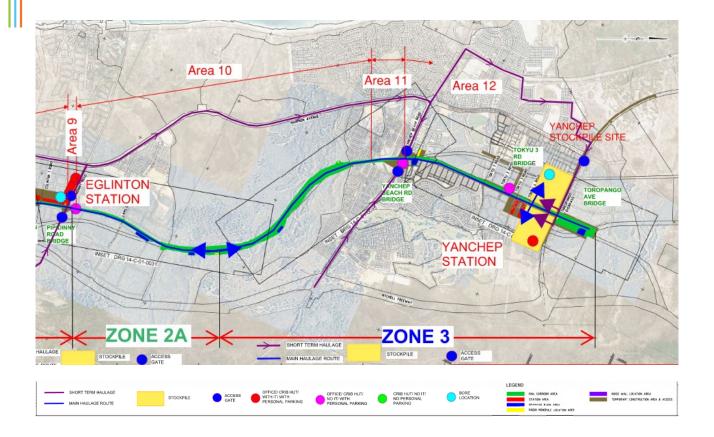
Milestone	Target Completion Date	
Bridges Complete	07 October 2021	
Final Commissioning	13 May 2022	
Stations Complete	19 April 2022	
Project Complete	07 July 2022	
Operational Readiness and Drivers Training	19 May 2022	
Removal of the Butler station crossovers 1071 and 1072	November 2022	

The YRE project has established three construction zones as shown in Figure? below for effective and efficient management in terms of program, traffic staging and cost whilst minimising disruptions to stakeholders including train operations and the public.

Figure ?: Project Zone Layout below diagrams for the boundary of each zone.



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The program of dates for commencing construction of each YRE station and their anticipated date for commencing the operation of a passenger train services is summarised in the table below.

Station Project	Date for Construction	Day One Operation Date	
Alkimos	11 November 2020	19 May 2022	
Eglinton	4 January 2021	19 May 2022	
Yanchep	18 December 2020	19 May 2022	

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# **APPENDIX N SUMMARY OF OGA AND SDRP COMMENTS**

# **YANCHEP STATION – DESIGN REVIEW**

# **DRAFT COMMENTS**

PRINCIPAL NO:	OGA COMMENTS (FEBRUARY 2020)	OGA RECOMMENDATIONS	CAMPS/NEWest RESPONSE	STATE DESIGN REVIEW PANEL REPORT COMMENTS (JUNE 2020)	CAMPS/NEWest RESPONSE
1. Context / character	Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.	<ol> <li>Consider a precinct and character study to ensure seamless integration of the Station and the greater Activity Centre Plan.</li> <li>Seek design opportunities to strengthen unique Yanchep sense of place for the Station and related infrastructure.</li> </ol>	Line-wide character study completed. Context Plan completed. Yanchep sense of place further identified and being incorporated with the Station precinct and related infrastructure.	<ol> <li>Improve context responsiveness by enhancing built form design, landscape, public art and public realm integration.</li> <li>Seek design opportunities to strengthen unique Yanchep sense of place for the Station and related infrastructure by referencing and incorporating more strongly the east-west green link into the public realm design.</li> </ol>	<ol> <li>Context-responsive design includes adoption of site specific identity (caves, limestone and Banksia) and integration of these design themes with both architectural and landscape architectural materials and finishes.</li> <li>East-west link is being further developed / refined by YBJV and Metronet/Newest designers.</li> </ol>
a.	The Panel notes the intent to create a consistent design identity for Yanchep and 3 new METRONET Stations on the northern Line. There is merit in ensuring architectural consistency and coherency to successive Stations, however landscape and public art should be employed to bring a specific character and local identity to the individual Stations and their setting.		Consider Aboriginal Engagement Strategy, structure plan reports and area history. Prepare culture statement that design interpretation can be drawn from.  A cultural statement for design interpretation has been prepared referencing the Gnarla Biddi and in liaison with the Noongar Reference Group.	The Panel broadly supports the intent to create a consistent design identity for the 3 new METRONET stations on the northern line. There is merit in ensuring a cohesive architectural approach to successive stations, however the Panel maintains that architectural treatments, landscape and public art should be better employed to bring a specific character and local identity to the individual stations and their setting.	Potential Public Art location have been selected.  - Shade structures at the southern entrance. Lazar cut panels to underside of canopy.  - Tiled walls to the platforms - Sculpture within busway
b.	Whilst this project was initiated prior to METRONET's use of precinct plans and the introduction of Design WA and SPP7.0, there are still expectations for a contextually – appropriate design response. A simple character study could be helpful to better understand the unique Yanchep sense of place.		PTA to consider Character Study	The Town Centre will take time to develop. As one of the first deliverables, the Station is an opportunity to establish an intermodal transport node that demonstrates high quality landscape, public realm and well-designed station architecture, thereby making a significant civic contribution to a new Strategic Regional Centre.	Agreed, The further development and refinement of the design of Station and precinct and the ties with the town centre is in progress with further liaison ongoing between YBJV and Metronet/Newest designers.
c.	The train Station is well placed to establish the public realm benchmark for the greater Regional Centre. To successfully catalyse the new precinct, the Station should contribute to place activation in addition to supporting its transport function. Continued engagement with the landowner / developer in relation to their Activity Centre Plan will help ensure an integrated transport hub, with connected green links and a mixed use public realm.		PTA to develop Station Precinct integration within Structure plan through Landowners and Newest Team engagement.	Use of a floral motif as the differentiation for the three stations (Melaleuca, Grevillea and Banksia) may have merit but appears somewhat tokenistic at this stage. Consider how this would work with specific Yanchep references, or relevant Indigenous cultural references.	Station identity and the design interpretation adopted for Yanchep Station responds to,  - Simplicity - Identity - Sustainability - Amenity - Functional planning fulfilling operational requirements - Public art , colour, landscape.
d	Establish and capitalise on the arrival / departure experience that Yanchep Station should offer to residents, visitors and tourists.		Exploit visual connections through voids within Station. Develop entry design.	architecture is a valid whole-of-line strategy as discussed in DR1, however it would have greater impact if a more distinctive transit environment was created for each station, responding to its respective setting, enhancing local character and providing a stronger sense of place.	Alkimos Station facia and façade approach has been considered. It is distinct, identifying, and different to Yanchep and Eglinton. The Yanchep design interpretation will be Developed providing individuality to Yanchep station.
e.	Consider Yanchep Station as a gateway to nearby northern beaches and related destinations by providing efficient and well-integrated transit connections and clearly identifiable linkages and references to nearby tourist destinations.	further developed to enable legible directions for patrons and toursists.	Develop way finding, digital display integration and promotion opportunities within Station and Precinct.	The east-west green spine running to the south of the Station and in which the Bus Port is integrated, could be more visible within the design of the main public realm space which connects the Station to the Bus Port to deliver a unique point of differentiation for this Station. Currently the lack of	Shade structures with the forecourt are a PTA structure that can assist the activation of the forecourt by others.  Liaison between stakeholders including the City of Wanneroo and YBJV is ongoing to provide an enhanced space able to be activated and

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				activation and unresolved design of the Forecourt, means the benefit of the expensive capping of the rail line is not yet being realised.	programmed. Shade, raised planters and seating, power and water supply and other facilities are being investigated for installation within the space.
f.	Consider the long-term context and plan for a compact higher density Regional Centre, which should include a well-positioned multi-level carpark.		PTA to consider with Landowners	Establish and capitalise on the arrival/departure experience that Yanchep Station could offer to residents, visitors and tourists as a main point of arrival to nearby regional destinations, including the mid north-west.	Development of interior spaces colour, public art and material texture of the design interpretation is supported by signage, furniture and movement to establish arrival and departure. Should PTA adopt promotional material within the station it would further support this.
2.Landscape quality	Good design recognises that together landscape and buildings operate as an integrated and substantiate system, within a broader ecological context.	<ol> <li>Engage a landscape architect as part of the Station design team as soon as possible.</li> <li>Utilise a strong landscaping design to mitigate climate conditions for Station, public realm and related infrastructure and deliver a unique Yanchep sense of identity.</li> <li>Re-configure the Kiss and Ride.</li> </ol>		<ol> <li>Ensure a holistic and integrated landscape design for the Town Centre, which includes all public realm spaces between Bus Port, Kiss and Ride and Station. Demonstrate how the spaces will be used.</li> <li>Optimise the opportunity to better reference Yanchep character in the built form, landscaping and public realm.</li> <li>Integrate WSUD strategies into landscape and urban design.</li> <li>Ensure phasing-out of irrigation will still deliver a high-quality public realm over the long term</li> </ol>	The landscape architects continue to present and work closely with Developer. Strengthening of the landscape design and its references to the place's site and cultural qualities is ongoing through the detailed design phase of the project.  WSUD strategies are under development with the civil engineer.  Irrigation demand is being minimised while balancing the requirements to maintain green, healthy plants.  Temporary landscape zones are being rationalised/ minimised
a.	Prepare a landscape design proposal. Appropriate landscape character around the Station would benefit this project to ensure public realm within the METRONET remit contributes to a unique setting for the emerging Regional Centre.		The landscape design proposal is being developed that responds to the local setting and that helps to integrate the station with the emerging Regional Centre including elements of place and pedestrian activation, shelter, lighting, flexibility, greening and public safety.	The appointment of the Landscape Architect is welcomed. The Panel acknowledges Landscape design is at 5% design stage.	Noted. The design has now progressed to a "15% Design Stage" development.
b.	Provide a district level drawing that clearly places the Station within the Activity Centre Plan so that greater green links can be understood and emphasised. The fundamentals are already strong with the placement of the bus-port perpendicular to the Station within a proposed green link. Supplement with a strong landscape plan that gives the bus-port / new open space a high level of amenity and legibility.		The district level drawing including green links is being prepared as part of the landscape design proposal.	Whilst the Banksia menziesii has the potential to be a useful landscape motif, the powerful topography of the Yanchep locale, adequately referenced in landscape and urban design is not yet visible and should be made more evident	The landscape architects and architects have refined and strengthened the landscape and architectural place themes adopted for the project at each station. These themes will continue to influence and strengthen the landscape design as it matures through the detailed design phase.
C.	Develop a landscape design approach for the Station, entry approaches, urban realm, car parking and bus port that celebrates the unique character of Yanchep. To undertake this work, the Panel recommends engaging a landscape architect as a priority. A well-integrated engaging Station that contributes to identity and streetscape character will be valuable in establishing the Strategic Regional Centre.		A landscape architect has been engaged to design the approach for the Station, entry approaches, urban realm, car parking and bus port that celebrates the unique character of Yanchep.	Further consideration of the microclimate of the Station Forecourt is needed. How can a tree canopy be provided to improve amenity of this large space? The type, scale and intent of tree planting will need to be considered given the 'planting on structure' condition. The location and further detail of selected tree species is required for the next review.	
d.	Interpret, incorporate and communicate the local indigenous heritage and sensitive ecology to capitalise on the theming opportunities for the Station / public realm based on local elements.		The landscape plan will pursue design themes drawn from the local place including consideration of the interconnected nature of Perth's historic Noongar network and the current rail network. This aligns with the Gnarla Biddi (pathways) Strategy or the way that people travel and connect to places, linked to a shared understanding of Aboriginal history and culture.	and investigation into how this space is to be used,	

e.	Consider design and landscape innovation for the rail culvert north and south of the Station to deliver a point of differentiation and contribute to stronger greening of rail infrastructure, which can assist with habitats for flora and fauna.		The landscape plan will provide guidance to restore and revegetate the slopes of the permanent way and include provision of shade trees along the Principal Shared Path.		Agreed, however the area between the carpark and the busport is being undertaken by the Developer.  The Design team have sought to co-ordinate the station landscaping works with the Developers plans for these areas.
f.	Incorporate new trees around the Station and utilise deep root zones wherever possible to provide a strong future urban canopy for this Centre.		The landscape architect will collaborate with the civil engineer to incorporate new trees around the station and comply with SWTC requirements providing for adequate soil root zones.	With the main public space being positioned on the rail capping area, this new urban centre could be dominated by large areas of paving and hardstand. Consider enhancing linkages with nearby proposed east-west green spaces, with the aim of including and restoring lost and damaged ecosystems.	Agreed, the east-west green linkages are outside the PTA development and are part of the overall precinct works undertaken by the Developer.  The Design team have sought to co-ordinate the station works with the Developers plans for these areas providing a key linkage East to West across the rail.
g.	Better consider the climate conditions (sun, wind, rain) that will impact the landscape and public realm design.		The landscape architect will collaborate with the civil engineer to incorporate new trees around the station and landscape buffer zones to improve or mitigate patrons' exposure to uncomfortable climate conditions (sun, wind, rain).	Utilise the large 1000 bay carpark to create a tree canopy to the north-east quadrant of the urban centre, and to compensate for the limited scope for large trees and deep root zones within the main public space between Bus Port and Station.	The carpark has been further developed to integrate large trees both within the carpark and along the carpark perimeter.
h.	Reconsider the on-grade carpark design to deliver a more uniquely Yanchep response, working with existing vegetation and trees to deliver a more organic, responsive and appropriate design, which also enables staging. Include a greater number of trees.		The project design team will collaborate to (where practical) retain vegetation including trees within the car park zone and consider staging that maximises tree retention and landscape buffer retention over the stages of the development cycle.	Incorporate an innovative approach to drainage (consider a system of swales) to maximise the tree canopy within carpark area. What is the timing of these carparks to ensure the landscape investment is not sacrificial over the medium term?	The carparks are to be constructed for Day 1. The
i.	The Kiss and Ride green triangle zone in the forecourt is currently locked by roads. Could this be redesigned to provide a green space that is accessible?		Yes. This will be reconsidered.	An integrated landscape proposal to the rail corridor north and south of the decked Station will be important for long term urban tree canopy provision.	
j.				Phasing out irrigation beyond initial establishment is understandable from a sustainability perspective, however the Panel questions the impact this move might have on the delivery of a high-quality urban realm. The next layer of detail in WSUD strategies is also encouraged.	Irrigation demand is being minimised while balancing the requirements to maintain green, healthy plants. WSUD will be utilised where this can provide sustainable benefits to the place. Design Enquiry is ongoing through the design development phase.
3.Built form and scale	Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.	<ol> <li>The planning of the south end of the Station needs reconsideration to retain the power of the simple form and ensure more successfully active edges. Clearly signal entry points and create an overall stronger civic sense to the building.</li> <li>Confirm, design and compose essential Station paraphernalia as part of Station design.</li> </ol>		<ol> <li>Provide additional information with respect to Kiss and Ride, where a ring road circumnavigates the future development site.</li> <li>Further refine the Station architecture. Better integration of the awnings, canopies and other features is required.</li> <li>Eliminate blank walls to the Station building where possible and introduce transparency and texture / patterning where appropriate.</li> <li>Prioritise southern elevation of the Station building to strongly and positively address the Forecourt.</li> </ol>	
a.	In pursuing the 'simple elegant box' approach as the architectural concept for the Station design, extraneous additions and projections to the form should be avoided. Service and other elements at the southern end of the Station should be accommodated within the rectangular plan to maintain the clarity of the formal language.		Develop Station concourse design to achieve a 'simple elegant box' form. Develop Station entry design response to support the Station language. Integrate essential Station paraphernalia within the Design solution.	and the location of the Bus Port as part of the linear east-west park. Effectively connecting the Bus Port to the Station will require a well-designed urban Forecourt that provides sun and wind protection.	Noted. The architectural design of the canopies is being further developed in this area.
b.	Realistically incorporate the various components that are essential to Station			The Panel would welcome more information on the proposed 'umbrella' canopies components within	

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	operations; signage / bike parking / bins/ other, into the renders. Ensure careful design and composition so that the 'elegant box' architectural approach is maintained.			the Forecourt. Consider how these elements work with the architecture of the Station so they read as a related suite of components	developed in incorporate raised planting and seating. The columns and struts are clad in an open mesh to allow creeping green cover and seasonal flowing to cover the supporting structure with the public
C.	Clarify plant location to confirm uninterrupted roofscape, as the low Station will be overlooked from future commercial and residential towers.		Hide plant over solid building elements within Station under the main roof.	In general, the built form of the Station facility appears well-considered. It is legible, economical and well-organised. The Panel encourages further work to ensure that major formal elements integrate better with each other. This is particularly important for the junction of the main Station canopy element. This will require simple and robust detailing and junctions. The renders and drawings provided are slightly inconsistent regards how the canopy relates and attaches to, the overall built form.	Further consideration within the detailing will include a negative detail between the station façade and the fascia.  The columns with the shop front have been moved to be inside the shop front line and the downpipes likewise have been moved to sit inside the shopfront of the station.
d.				Whilst the Forecourt is generous, it appears unprogrammed and as a remnant space left over after infrastructure has been positioned. Integrate this large area more effectively with the Station and greater precinct to deliver a singular destination.	This is to be further explored with PTA
e.				The Panel seeks clarification of the new configuration and position of the Kiss and Ride to assist understanding of how development of this site (including servicing) can coexist with PTA requirements. The street-based and urban arrangement for Kiss and Ride could be a worthwhile improvement, if landuse planning and proposed use of the development site was better understood.	not yet confirmed by the developer but is understood to be of mixed use. Servicing of the lot is from the public access road running North-
f.				The combination of glazing for transparency and daylight, and the use of louvred treatments and decorative cladding for the remaining Station walls is supported. Use the solid cladding as an opportunity for place-specific imagery or texture and pattern	Noted
g.				The facades facing south are an important frontage. Ensure these elevations address the public realm in a more considered and animated way.	been introduced to the southern façade. The
h.				Reconsider blank walls within the Stations elevations and ensure external treatments better reflect the internal activities of the Station, introducing transparency and visual interest.	room transparency within the southern façade will
4.Functionality and build quality	Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.	<ol> <li>Consider a staged approach to parking, including confirmed location of multi rise parking at full buildout.</li> <li>Redesign the road system south of the carpark adjacent the development lots.</li> </ol>	PTA to respond to Principal 4 comments	<ol> <li>Consider delivering the multi-deck carpark in stage 1 to avoid government investment in a temporary carpark (including landscaping) being sacrificial.</li> <li>Clarify location of peripheral infrastructure and integrate to minimise negative impact on Town Centre.</li> <li>Reconsider the double road arrangement between carpark and development sites to the east of the Station.</li> </ol>	
a.	The Panel congratulates the project team on the sinking of the rail line for the Yanchep Station, which will help facilitate a good quality public realm befitting the Station's location within a Strategic Regional Centre.			The Panel broadly supports functional planning and approach for the Station building.	Noted

b.	Ensure that public transport infrastructure is integrated with future surrounding development and has a direct connection with the proposed CBD of the Town Centre.			What is the timeframe for the temporary carpark to the north-east and when is the multi-deck carpark likely to be delivered? The staging of the carpark will need careful consideration to avoid landscape investments being sacrificial in the medium to long term.	to allow a future staged development of the
C.	Can the 1000 bay, 7-10 Ha carpark be staged, including a multi-deck option, in anticipation of a future Town Centre build out, so this strategically located land can be future proofed and given over to more appropriate Regional Centre land-uses? Consider such staging from the outset.			Peripheral infrastructure items should be identified (substations, bike shelters, other) to better understand their impact on public realm. It is recommended these elements be integrated into built form or landscape wherever possible to ensure holistic consideration of the public realm	Noted, these are shown on the design drawings at locations where they can be integrated or have minimal impact on the public realm
d.	Future alternative transport options should be considered, and flexibility built into the precinct plan including carparking area / staging, increasing ride share, autonomous small vehicles provide opportunities for large areas of carparks to be reduced and utilised for more active development and / or green infrastructure.			Yanchep will be slow to develop. The Station will effectively establish the 'heart' of the Town Centre. People will spend time here daily; commuting, waiting and dwelling. Consider how the Station can contribute activation to assist the development of the Town Centre and act as a destination	PTA to comment, however the surrounding developers plans focus on the station building, given its key transport function as a key instigator to the development of the town centre.
e.	In noting the strategic intent to positively influence behaviours around public transport / commuting; the Panel considers it counterintuitive to focus on arrival by car and to provide an oversupply of parking, even if it is sacrificial. Clarify the number of car parking bays required for Day 1.			The nature of the commercial development of Lot A needs further attention regarding provisions for permeability, safety, lines of sight, and nature of development, including use. The Panel understands that this will need to be progressed jointly with the developer, however there is concern around the viability of any development ringed by a drop-off road	along with the ring road has been developed in
f.	The configuration of roads adjacent the commercial lots south of the carpark requires redesign to improve access and efficiency and deliver feasible development lots in this location.			Future provision of decked parking is strongly supported. What is the timing of delivery? Skinning with activated frontage (commercial/retail uses) is encouraged	to allow a future staged development of the
g.	Bus layover could be considered out of the city core to avoid bus idling adjacent commercial premises and to improve the environment for bus patrons.			As highlighted in DR1, the double service roads of the carpark entry and development site service roads is a poor outcome. The Panel understands that there is no agreed context plan available as a reliable reference. Ensure current arrangements do not diminish longer term urban design outcomes.	There are no double service roads to the development. The outcomes of DR1 were taken onboard and a public road access developed. Alongside the carpark and development lots to the South.
h				More information is required to interrogate the built form functionality and material choices.	A colour board and materials specification have been developed.
5. Sustainability	Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.	<ol> <li>Commit to an environmental sustainability strategy and / or assessment framework.</li> <li>Ensure the roof design provides a suitable climatic response.</li> </ol>		<ol> <li>Consider submitting the Station design to an environmental assessment framework,</li> <li>Consider sustainable construction methodologies and materials.</li> </ol>	
a.	Consider submitting the Station design to an environmental assessment framework, optimising renewable energy, stormwater harvesting, water catchment and re-use and other sustainable initiatives.		PTA to consider the inclusion of PV Panels (provision provided for future as per SWTC), We should step through some of the sustainability options presented within the stations reports	The Panel recommends submitting the Station design to an environmental assessment framework.	PTA to confirm. The station has undergone sustainability reviews with PTA and has had environmental assessments undertaken for natural lighting, shade, wind.
b.	The Panel express concerns that the roof arrangement does not provide adequate solar protection to large areas of glazed walls facing east and west. Is it possible to treat each elevation more specifically for climate responsiveness?		2.8m (approximately) wide horizontal fin at 3m AGL between columns introduced to east and west building facades.  Integrate free standing structures providing continuous path of patron cover between Bus and Rail station with Stations Southern entrance.		considering all modal types and access to the

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C.	Climatic comfort (wind, rain and sun protection) for pedestrians / cycles should be a priority. A well-considered solution will reduce car parking requirements. As a Strategic Regional Centre, the provision for electric bikes should be considered – parking, lift size, charging and storage.		Secured bicycle parking is provided, lift can accommodate stretcher, gofer, and bicycle. PTA to advise if charging will be provided (at bike shelters – provision for car bays provided as per SWTC).		Access Strategy have been prepared for these
d.	Clarify with diagrams, pedestrian and cycle movement patterns in relation to the Station itself and more broadly to the surrounding precinct.		Arch/Civil/LA to co-ordinate and provide	Ensure WSUD for all aspects of landscape and public realm design.	The civil and landscape design are developing utilising WSUD principles.
e.	Ensure proposed Station ventilation strategy supports patron comfort and reduces energy use.		HVAC report section with model outcomes to be prepared	More information as to how sustainability has impacted Station design is necessary.	Sustainability aspects have been outlined within the Station Design Report.
f.	What is the function of single roof skylight to the Station? To the underground concourses? Will it contribute to building heat gain? With such large areas of glazing, there would appear to be sufficient daylight penetration.		Agreed. Skylights to be removed with PTA approval.	Consider the use of sustainable construction materials and methodologies.	Sustainability aspects have been outlined within the Station Design Report.
6. Amenity	Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.	<ol> <li>Design to optimise pedestrian experience, particularly in respect of climate.</li> <li>Incorporate landscape to improve the amenity of the public realm and to deliver an attractive healthy and welcoming place.</li> <li>Ensure the Station building provides adequate weather protection for patrons.</li> <li>Support activation and mixed-use opportunities.</li> </ol>		<ol> <li>Prioritise design of the Forecourt to deliver a high-quality public realm. Incorporate activation?</li> <li>Enhance commuter patron experience beyond the Station building.</li> <li>Provide sections and shadow diagrams to effect of heat, wind and rain on the Station environment has been adequately considered.</li> </ol>	<ol> <li>Forecourt design rationalisation and quality enhancements are ongoing as the design progresses through the 85% design phase.</li> <li>Patron experience outside station limits is being enhanced through application of cultural and context-specific landscape architectural design.</li> <li>Sections and environmental analysis and modelling are documented in the 15% Station Design.</li> </ol>
a.	Sections and shadow diagrams could be helpful in analysing the effect of heat, wind and rain on the Station environment. The Station building edge should be revisited to ensure adequate weather protection for patrons.		Shade analysis will be undertaken within the model. Model Environmental outcomes. Consider design options.  Pursue opportunities for pop up activation around station. PTA to confirm	As discussed in Landscape Quality, the landscape and urban design quality of the Forecourt should deliver the highest level of amenity to form the 'heart' of the Yanchep Town Centre. Ensure the landscape plan provides shade, comfort and protection.	implement this. The Metronet/Newest design team is liaising with the YBJV to ensure that design quality and seamless integration are both
b.	The bus interchange location is commended. Ensure the connecting public realm space between the bus-port and Station is of the highest quality to improve pedestrian experience.		Develop the canopy structures within the transition space.	The Panel seeks activation of the Station Forecourt and supports the kiosk and other uses continue to be considered to assist with delivering a welcoming, animated and safe public space	To be further developed with PTA.
C.	Shaded pedestrian links should be provided through and from carpark, with consideration of links to a future decked parking option. The use of landscaped shade provision should be considered.		The urban greening strategy within the landscape plan will provide for shaded pedestrian links.	Focus on the holistic commuter patron experience, including integration with Town Centre. Ensure amenity for users beyond the Station, including linkages to bus Port, Kiss and Ride and future multi deck carpark. Further clarification is needed on provision of shade, shelter and connections, utilising appropriate access routes that also support the broader Town Centre	Development interfaces are being coordinated with the Developer
d.	Whilst the Panel understands the PTA's reluctance to take on the role of landlord, activation of the Station is strongly recommended. Ensuring the kiosk is centrally and appropriately located as an effective activator, particularly in the early		Developed Design responds to comment.	Sections and shadow diagrams would be helpful in analysing the effect of heat, wind and rain on the Station environment.	<ol> <li>The station is fully enclosed providing shelter from sun, wind and rain.</li> <li>The station is ventilated through high level mesh or two stage louvres.</li> <li>Originally low level canopies provided façade shading. These have been replaced with</li> </ol>

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	days before the Regional Centre is constructed, is critical.				vertical fins and a Stainless Steel mesh façade.  4. A central skylight supplements the natural light through the façades penetrating the concourse through seven voids providing natural light to the platforms. The voids are also required for smoke ventilation in the event of a fire.
е.				Continue to refine Station building canopies to ensure adequate weather protection for patrons.	The Station canopies are being refined with a focus on weather protection to patrons and solar shading.
f.				The Panel notes that access to daylight and passive ventilation has been considered as part of Station design.	Noted.
7. Legibility	Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.	<ol> <li>Investigate Station specific identity markers as a wayfinding tool for passengers on trains.</li> <li>Revisit the arrangement and clarify entrances.</li> <li>Ensure pedestrian flow around stairs and escalator is optimised.</li> </ol>		<ol> <li>Ensure context integration by considering influences outside of the project site boundary to understand broader movement patterns within a Town Centre setting.</li> <li>Provide a safe, legible and amenable pedestrian access network between all transport infrastructure components.</li> <li>Ensure temporary carpark access is easy to navigate.</li> <li>Provide a clear hierarchy to all public spaces, with Station Forecourt designed to exhibit highest priority.</li> </ol>	<ol> <li>A station access strategy and movement pattern analysis are included in the 15% design. Movement patterns from the Town Centre are being anticipated and designed for,</li> <li>The landscape and civil design provides this linkage.</li> <li>Navigation, DDA access, rest spots and wayfinding are undergoing further design development and refinement.</li> <li>Hierarchy of spaces is being further defined during detailed design.</li> </ol>
a.	Whilst the last three Stations for this line will read as a suite, it is important that the arrival at each Station is somewhat differentiated for inattentive patrons. Consider public art, landscape or other individual identity indicators for each Station.		The developed cultural statement will provide for individualised design interpretation within the Station and Station Precincts.	Whilst the Panel understands the Station project site has a defined boundary, broader movement patterns and networks need to be clearly understood. Consider also where people are not allowed to go, and how this will be managed through design. What is the nature of the urban furniture that will address this? Are there bollards (or fences or other) and, where are they?	There will be bollards located at strategic locations within the precinct however the general principle is to incorporate landscaping element to limit vehicle entrances into areas where traffic is to be restricted. This is subject to further development in the design.
b.	Ensure legibility in wayfinding between Station, carpark and busport with effective public realm design, well considered signage and a strong landscape plan.		Promote intuitive wayfinding within the Station Precinct landscape planning.	Ensure all interstitial spaces between Kiss and Ride, Bus Port and Station have a clear hierarchy. Diagram movement patterns between these spaces and the greater Town Centre precinct to ensure connectivity is well-considered and that the proposal is modified where required. The Forecourt between Station and Bus Port is the highest order public space and its design should reflect this. Currently the Forecourt is a largely empty space with limited appeal	The finishing to the Plaza area is being further developed.  Stakeholder liaison and design integration is ongoing.  Context-specific design, early community activation by the developer, place making and the needs of users and asset owners are being balanced through a process of design development, coordination and ongoing liaison. This is to be shared space.
C.	Provide a perspective for the southside of the building in addition to the ones from north. The south is the activated end of the Station and the elegance and simplicity shown in the render from the north is less important than the southern view.		Will provide additional model views.	Legibility within the Station building is clear with appropriately positioned access points.	Noted
d.	The 3 current entry points detract from the simplicity of the building – consider rationalising. Ensure legible entries have a civic sensibility befitting a public transport node.		Station concourse design distilled to a 'simple elegant box' form. Station entry design response to support the Station language. The multiple entries provide for flexibility in the development of the Structure Plan integration.	further attention. Consider scenarios of night time travel, inattentiveness, disorientation and lack of	Lighting and wayfinding in the precinct is being further developed to provide a clear and safe access around the station precinct.
e.	The provision of movement diagrams both for the Station itself and the broader precinct		Will be developed in design	Reconsider the access to the car parking and kiss and ride circulation system. This is currently a	

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	will help with understanding the needs for different users.			single loop and likely to lead to confusion and unnecessary vehicle activity in the Kiss and Ride.	the kiss and ride is to be provided to minimise unnecessary vehicle traffic.
f.	The colocation of the Stairs and Escalators with the entrance needs attention. Has pedestrian flow been modelled? The volumes are probably limited initially, but there is a tight turn back from the head of the stair to the fare gates. Will this clash with pedestrian flow from the escalators? Is there sufficient space to prevent crowding?		Pedestrian Modelling to be undertaken for the revised layout.	Wayfinding between commercial development and patron drop-off is unclear. Further analysis of movement patterns is required.	The pedestrian paths and pathways have been modified in this area to provide clearer movement patterns along desire lines.
g.	Any Precinct Plan should establish an urban design format that reinforces public realm and identifies connections between the Station, carpark, busport and greater Activity Centre.		The landscape plan for the Station Precinct includes urban design considerations including the establishment of good quality public ream around the station and its interfaces with the surrounding development areas.		-
h.	After hours pedestrian / cycle access across the stadium podium / tracks should be prioritised in the interests of the future emerging Centre.		Civil Engineer to consider		-
8. Safety	Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.	<ol> <li>Deliver a safe Station with 24/7 consideration.</li> <li>Reconsider the column numbers and / or placement with respect to potential visibility and mitigation of antisocial behaviour.</li> </ol>	Transparent Station Design. Central Station Booth servals' the station interior 360 degrees.  Developed Station design modified column positions. Structural Engineer to consider removing the East side columns to the island Platform.	<ol> <li>Deliver a safe Station with 24/7 consideration.</li> <li>Consider the safety and surveillance of the Kiss and Ride circulation system at night.</li> </ol>	<ol> <li>24/7 safety is being considered at each stage of the design process.</li> <li>CPTED and Security (CCTV), passive and active surveillance and PTA operational actions are being further developed.</li> </ol>
a.	Ensure a successful 24/7 experience for the Station. Consider CPTED principles, lighting and pedestrian routes outside of normal working hours.		Business as usual for Station Design and has been incorporated into design.	Provide a safe, legible and amenable pedestrian access network between all infrastructure components.	Pedestrian paths are provided to interconnect with the Station infrastructure and also to join the external planned pathways within the town centre (including the PShP provided to the South of the station along the rail corridor)
b.	Optimise safety for users of the Station Precinct. Prioritise active uses and opportunities for passive surveillance (including well designed and positioned kiosk), to reduce reliance on active transit security.		Noted	Ensure safety and surveillance of the Kiss and Ride circulation system at night.	Noted, The Kiss and Ride circulation
C.	Additional information is required on columns and potential train derailment loads. Consider reducing the number of columns are optimally placed to facilitate ease of movement and security of passengers. Excessive columns could support antisocial behaviour / blind spots. Consider integrating into stair/ other structural points or align with elevator edges or lift shafts.		robustness and redundancy of station structures in	Ensure a successful 24/7 experience for the Station. Consider CPTED principles, lighting and pedestrian routes outside of normal working hours	
			spans in the event of column loss would be unreasonable)		

			<ul> <li>Columns are generally offset from lift or stair structures by a minimum amount to limit the opportunity for antisocial behaviour</li> </ul>		
			Column positions at the concourse level have been set to eliminate transfers whilst accommodating the function layout		
d.	Line of site between drop off and Station entry is essential and is well addressed by the design.		Noted		
e.	A carefully considered urban design, with strong landscape plan is necessary for the immediate surrounds of the Station. Connections, currently generous in scale, should be well lit, legible and inviting and address CPTED principles.		The landscape plan for the Station Precinct includes urban design considerations including the establishment of good quality public ream around the station and its interfaces with the surrounding development areas. CPTED principles are being applied during the design process to ensure user comfort and safety.		-
9. Community	Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.	<ol> <li>Continue collaboration with the Developer regarding the Town Centre Activity Centre Plan in order to achieve a cohesive response.</li> <li>Support important, early activation with a well located and designed Kiosk.</li> </ol>		<ol> <li>Prioritise urban design outcomes for the Station precinct as a core project objective.</li> <li>Activate the large, currently unprogrammed Forecourt space. Ensure Station Forecourt is well designed and integrated with the greater Yanchep Town Centre.</li> <li>3. Prioritise pedestrians over cars and buses wherever possible, and as befitting a Town Centre.</li> </ol>	<ol> <li>Metronet has this as a project objective.</li> <li>Refer to comments and responses already made above.</li> <li>Noted and this is being actioned.</li> </ol>
a.	Design the Station public realm with people in mind, creating opportunities to meet and socialise. Ensure forecourt design includes places for sitting and waiting, with shade and protection.		The landscape plan for the Station Precinct includes good quality public ream within the forecourt including places for sitting and waiting, shade and protection from strong winds.	Ensure the Station forms part of a carefully considered overall urban design outcome, with a strong landscape plan which integrates and strengthens connections with the future Town Centre. Using the east-west green link would be an effective way to integrate the Station with future urban development.	The comment is noted, however activation of the areas and the interconnectivity to future East-West connection is outside PTA control. The designers have engaged with the Developer to integrate with the future planned development and precincts.  The Plaza landscaping will be developed further to provide a high quality public space
b.	Optimise public art as a means of developing a more unique identity for Yanchep Station.		Noted	Ensure the Forecourt design is optimised to become the 'heart' of the Yanchep Town Centre. Diagramming pedestrian and cycling access network to better understand links (particularly with respect to the carpark and Bus Port) with the greater Town Centre would be helpful.	station access strategy document has been
C.	The generous Station forecourt public realm is commended but requires more detailed urban and landscape design. It has the potential to be a connector for not just the Station but the greater Regional Centre.		The landscape plan will be further developed during the detailed design process to further distil its unique identity and place qualities.	Activation of the Station will be improved with the reconfiguration and replanning made with respect to the kiosk being positioned more appropriately. The Panel was disappointed to hear that the design intent for stations is to discourage 'loitering'. Successful public spaces encourage people to 'stay'; increasing safety, activity and amenity.	The Plaza area and station precinct are being progressed in the design as public spaces. The design team is working with the PTA to balance operational needs, safety and successful public space outcomes.
d.	Continue to test and position the Station design within the greater Activity Centre plan to provide a transit hub that seamlessly integrates with the community it will serve.		Noted	Ensure pedestrians are prioritised over cars, as required by METRONET's Station Precinct Objectives.	Noted, this is as per the current design.
e.	Optimise physical connections – pedestrian, cycling and vehicular – to link and attract users from the local catchment to the Station. Have the Station Masterplan / Precinct Plan provide links to surrounding residential areas, nearby beach, future CBD and other local points.		The project Landscape Architect and Civil Engineer are considering these links and further developing them during the detailed design process to ensure greater connection to surrounding residential areas, nearby beach, future CBD and other local points.	The large Forecourt is currently unprogrammed. Activation and high-quality public space design are essential as part of the rationale for the significant expenditure associated with sinking and capping the railway in this location.	The comment is noted, however activation of the areas and the interconnectivity to future East-West connection is outside PTA control. The designers have engaged with the Developer to integrate with the future planned development and precincts.

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f.	Optimise, the location and size of the 30m2 kiosk in the Station building, allowing it a		Kiosk repositioned		It is agreed that the capping is a significant investment that future-proofs the space and avoids severance issues that would be there without the Forecourt.  The Plaza landscaping and programming will be developed further (involving stakeholders) to provide a high quality public space
	more central role within the overall Station design.				
10. Aesthetics	Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.	<ol> <li>Strive to maintain the integrity of the simple box architectural approach, without loss of environmental performance.</li> <li>Work diligently to design and compose all Station paraphernalia to ensure the highest quality outcome for the Station.</li> <li>Consider the Yanchep identity more thoroughly in order to inform the aesthetic of the Yanchep Station at the next stage of design development.</li> </ol>		<ol> <li>Strive for differentiation and ensure stations contribute to a unique character for each Town Centre.</li> <li>Reconsider canopy design to better respond to overall architectural language, particularly that of the roof form.</li> <li>Simplify column designs and carefully consider a coherent approach to detailing with respect to column, canopy and roof form junctions.</li> <li>Ensure public art integration and design differentiation is rich, sophisticated and specific for each station.</li> </ol>	<ol> <li>Further definition of the Yanchep Context and Character has been undertaken.</li> <li>Canopy design has been rationalised.</li> <li>This has also been addressed</li> <li>The public art will be integrated as first preference. It will be informed by the Context and Character of the place.</li> </ol>
a.	As the building itself is part of a suite of three Station buildings, consider a design layer for this Station that responds to the unique character of Yanchep and provides a stronger sense of place, reinforcing Yanchep Station as a destination. At this stage in the procurement process, this is best achieved through landscape, urban and integrated public art design,.		The developed cultural statement will provide for individualised design interpretation within the Station and Station Precincts.	Changes made to the Station building as a result of DR1, including the removal of extraneous additions and projections have been effective in clarifying the 'simple elegant box' concept.	Noted
b.	Success of the 'simple elegant box' approach will depend on preserving concept integrity, and avoiding unnecessary 'addons' to the box which could otherwise diminish clarity of this simple but powerful design language.		Station concourse design distilled to a 'simple elegant box' form. Station entry design response to support the Station language. The multiple entries provide for flexibility in the development of the Structure Plan integration.	As part of a suite of three Station buildings, the Panel encourages the next design phase to ensure this Station responds to the unique character of Yanchep and provides a stronger sense of place. At this stage in the delivery process, this is likely best achieved through integrated architectural refinements, landscape, urban and integrated public art design.	Responding to identity.  - The ceilings of all stations have been developed - Tiled patterns to the platform retaining walls developed. Yanchep 400x100 Chevron - Colour - Public Art
C.	Ensure the architectural renderings take into account the essential Station paraphernalia. Renderers from the more important southern viewpoint, where the impact of the building will be greatest, are required.		Noted	In progressing differentiation, consider the impact each of these stations will have on establishing a unique character for future Town Centres.	The bus station form has been developed to identify the form with the station and shade structures that interface the bus and train stations.
d.	The roof form and minimalist material palette represents quite a stark civic character that may not be entirely appropriate for the Yanchep location. However, the simple box approach can be made to work if a genuine Yanchep character influence from landscaping, urban design and public art can be made visible.		The landscape architect is considering these genuine Yanchep characteristics and developing them into a coherent design scheme for the Station Precinct.	Develop the 'simple elegant box' approach further by simplifying the design of the column heads. A simple unadorned column will work more successfully with the established design language and will ensure the new long canopy can connect to the box simply and directly. Currently the detailing is unclear and appears untidy. Ensure that all columns are of the same 'design family'	Agreed the internal columns will have "the prongs" removed. Design investigation will be undertaken to consider,  - Unadorned column heads - Cantilevered facia with no columns and independent low level canopy
e.	The simple box should still provide an effective climatic response, including sun protection.		2.8m (approximately) wide horizontal fin at 3m AGL between columns introduced to east and west building facades.	The design language of the entry canopy (aerofoil shaped) doesn't appear to fit the angular form of the roof and is not yet well integrated with the Station	The aerofoil form has been changed to a form that reflects the facia.

		Shade analysis will be undertaken within the model. 'box'. Refine this important component, including  Model Environmental outcomes. Consider design resolution of attachment to main structure.  options.
		Environmental modelling will be undertaken, shortcomings addressed within Station simple box Design.
f.	Redesign the southern end of the building, which is currently dominated by service / plant rooms, which create inactive edges and a lack of transparency. Strive for a strong civic sense of arrival and departure for this building.	Station concourse design distilled to a 'simple elegant box' form. Station entry design response to support the Station language. Transformer compound to be moved away from Station, integrated into Precinct design.  Station concourse design distilled to a 'simple Public art should be considered early and Public Art integration opportunity have been integrated into the built form. The current flower identified to the shade structures at the south end of the station, platform walls tiling, Exotec feature colours is not yet utilising the potential of a fully integrated public art strategy and will not achieve the sense of identity and differentiation that could otherwise be achieved.
g.	The external render shows a 'tree' type column along the east and west side but plain columns on the north, and no indication of the south columns. Ensure consistency for this component unless there is a specific design intent for such diversity.	Agreed. Station designs are being explored at the three locations the column head may be a point of difference between stations.
h.	Provide further information on plant location, screening and treatment. With the adoption of a simple box approach for architectural language and a strong roof form, the location of plant will be critical.	Hide plant over solid building elements within  Station under the main roof. Access to space under roof via fixed ladders to hatch.

#### APPENDIX O PRELIMINARY DRAINAGE PLAN

