



# Ellenbrook Station Development Approval - Report MEL-MLCX-AR-PER-00001

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Status Information		
Deliverable Review Status	InEight Document Code	Description
<input type="checkbox"/> <b>ACCEPTED</b>	<b>ACC</b>	Acknowledgement by PTA that, following a risk-based review, the deliverable appears to be satisfactory. Acceptance by PTA: 1. Indicates that the deliverable appears to comply with the specified requirements, including applicable standards and legislation; 2. Indicates that the deliverable appears to have been produced in accordance with the relevant engineering assurance processes; and 3. Does not remove or alter any duties or responsibilities placed on a party by the Contract, standards or statutory regulations.
<input type="checkbox"/> <b>ACCEPTED WITH AMENDMENTS (ACCEPTED WITH CLARIFICATION)</b>	<b>ACC-AMD</b>	The design may proceed for the related design works. The design deliverable shall be amended and resubmitted for final acceptance within the time frame specified by PTA in the Review Comment Sheet. This incorporates the EM4P Category 2 – Accepted with Clarification
<input type="checkbox"/> <b>(NOT ACCEPTED) REVISE AND RESUBMIT</b>	<b>REJ-RSB</b>	The deliverable is non-compliant and introduces risk. It requires the reissue of amended documentation, as well as, a written response to the comment. The resubmitted deliverable shall be subject to a further acceptance review as specified by the CPE in order to ensure compliance of the deliverable, and accepted by the PE and CPE.

The related Document **Review Comments Sheet** may be located by clicking the linked documents icon: “  next to the Document No. in the Documents register and scrolling to the Links section at bottom of the Document Record.



## **METRONET Stage 1: Morley-Ellenbrook Line**

### **Ellenbrook Train Station**

**MEL – MLCX – AR – PER- 00001**

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B	9 July 2021	Final issued for MELconnx/Public Transport Authority	Various	Feedback from PTA and updated technical reports
C	14 July 2021	Final issued for MELconnx/Public Transport Authority	Section 1, 2.1, 2.3, 3.2	Minor text updates in response to PTA comments.

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## 1. Executive Summary

Urbis acts as the planning consultant on behalf of the *MELConnx Consortium*, the appointed contractor to deliver the METRONET Morley Ellenbrook Link on behalf of the Public Transport Authority (the delivery agency for the METRONET program). The following development application seeks approval for the Ellenbrook train station and associated infrastructure, being one of five new train stations proposed as part of the METRONET Morley Ellenbrook Link project, being a network extension to Ellenbrook spurring from the redeveloped Bayswater station.

The Ellenbrook Station will be located approximately 27km north east of Perth, and will be the fifth and final station on the new MEL line. Once operating, the Ellenbrook Station is expected to half travel times for passengers, providing a journey time of 30 minutes from the station to the Perth CBD.

The Ellenbrook Train Station will be constructed within the Ellenbrook Secondary Centre, located within the City of Swan municipality. The station is designed as a multi-modal station, and will comprise the following:

- Main station building (including the station entrance and platform concourse) with typical station amenities. The station building is 'at-grade', providing direct and logical connections to The Parkway and adjacent 'Village Common' park area. This station design serves the dual purpose of improving the pedestrian experience and ease of access through the station and to the platform, as well as meet the PTA's safety requirement of delivering pedestrian access which does not directly interface with the rail infrastructure.
- Bus interchange immediately north of the Ellenbrook Station. A direct, weather protected connection is provided between the station building and bus interchange.
- Shared / Principal Shared Path to the southern side of the railway line, travelling west. This path will ultimately form part of a wider connection generally running parallel to the MEL track alignment, but is likely to be realigned to follow the Dampier Bunbury Natural Gas Pipeline (DBNGP). Inclusion of the Shared / Principal Shared Path within the METRONET MEL project will complete gaps in the existing network.
- Park and Ride bays are located up to around 350m from the station and sleeved from Parkway with development. Less focus is provided in relation to proximity to the station, compared to other modes. Parking is located on both sides of the railway due to space constraints to the south as well as improved traffic management. The parking layout and separation of parking to the north and south of the station also reduces the perceived scale of the parking.

A key objective in the station design is to apply principles which support transit oriented development (**TOD**), and encourage non-private vehicle use for connecting trips, as well as to support a diverse range of uses within the activity centre. However, the pragmatic requirement for long-term car parking for a new train station 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 desire lines and accessibility have been key drivers in the station design. This is demonstrated through the direct pathway from the station entrance to The Parkway, and the connection to Village Common. The at-grade station design also supports pedestrian connectivity by providing direct and logical connections to the public realm.
- Bus service convenience, with the bus interchange being located immediately adjacent to the station. Passenger comfort is considered in the design, with weather protection provided between the station and bus interchange.
- Drop-off and pick-up area within a short walk of the station entrance, as well as use of the parkway for informal drop-off, which also provides for on-demand transport options; and
- Segregated long-term (all day commuter) parking is provided, but designed and distributed to reduce the perceived scale of the car parking.

This hierarchy encourages patrons to consider private car alternatives by delivering these as a more convenient mode of transport with a highly positive user experience, as well as removing the impact of large areas of at grade parking from the highest pedestrian area immediately adjoining the station.

This report considers the planning context and merit of the proposed development, including an overall explanation of the station and key design drivers. This includes an assessment of the application against the relevant planning framework, including the requirements of State Planning Policy No. 7 – Design of the Built Environment and the METRONET Station Precinct Design Guide. As demonstrated through this report, the

thorough technical reporting, stakeholder consultation and careful design consideration have all come together through the Ellenbrook Station design to produce a transformative asset for the Ellenbrook region.

### Acknowledgement of Country

MELconnx acknowledges the Whadjuk People of the Noongar Nation as the Traditional Custodians of the land and waters on which the Morley-Ellenbrook Line Project is located. We pay our respect to their Elders, both past and present and thank them for their continuing connection to the country, culture and community.

## 2. Project overview

### 2.1 Morley Ellenbrook Line Background

METRONET is a key project of the West Australian State Government and the single largest investment in public transport ever undertaken in Perth. METRONET will positively change how people live and travel in Perth and significantly improve the connectivity across the metropolitan area.

The Morley Ellenbrook Link (MEL) project will deliver a total of 21km of rail line spurring from the Bayswater Station to Ellenbrook. The project includes the delivery of 5 new stations at Morley, Noranda, Malaga, Whiteman Park and Ellenbrook, as well as future proofing works for a future station at Bennett Springs.

The MEL is part of METRONET Stage 1, with the Public Transport Authority (PTA) being the lead agency delivering the MEL project. The project will design and deliver all rail infrastructure and ancillary works to support operational passenger rail between Bayswater and Ellenbrook, including stations with inter-modal bus and rail and associated road works at Bayswater, Morley, Noranda, Malaga, Whiteman Park and Ellenbrook stations.

Key works in the project include the following:

- A 21km rail spur from the Midland Line east of the Bayswater Station, travelling north in the Tonkin Highway median, east through land north of Marshall Road and north on the western side of Drumpellier Drive into Ellenbrook
- Stations at Morley, Noranda, Malaga, Whiteman Park and Ellenbrook with future-proofing for a station at Bennett Springs East
- Parking and bus interchanges/facilities at stations
- Significant grade separations at key road crossings.
- Tunnels to allow the rail line to enter and exit the Tonkin Highway median.
- Shared / Principal Shared Path for walking and cycling access along the rail line
- Track and associated infrastructure to connect to the existing Midland Line
- Road and bridge reconfiguration works.

A contextual summary of the MEL extension is illustrated at Figure 1.



## 2.2 Supporting Works Packages

Recognising the complexity of delivering the transport infrastructure for the MEL, the overall project works have been divided into three broad programs of work which make up the Ellenbrook Line – Program of Works:

1. New Bayswater Station (Evolve Alliance) – New station at Bayswater (to relocate and replace the existing station), including associated turnback infrastructure to allow the MEL to connect to the Midland Line.
2. Tonkin Gap and Associated Works (Tonkin Gap Alliance) – this project is being delivered by Main Roads and includes significant civil and structural works between Bayswater and Malaga, to prepare the Tonkin Highway median for access to/from and construction of the new rail line and stations.
3. Main MEL Project Works (MELconnx Consortium) – includes all rail systems and infrastructure from Bayswater, all stations and facilities within the Tonkin Highway median and road reserve, and all works north of Malaga to Ellenbrook.

This development application only applies to the Ellenbrook Station, which forms part of the Main MEL Project Works.

## 2.3 METRONET Scope and Requirements

In September 2020, the MELconnx Consortium (Laing O'Rourke Australia Construction) was named as the preferred proponent to design and construct the MEL, including the Ellenbrook Station and associated 'land-side' station infrastructure development.

As the MEL 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 Ellenbrook Station specifically, the SWTC sets following direct design parameters relevant to the scope of this development application:

- The Ellenbrook Station will be designed as a 'Closed Station; with automatic fare gates controlling access to and from the station platforms.
- Station platforms, which are to be a minimum length of 150m, designed to suit the operation of six car B and C series rail cars. The station platforms required to have 70% of the operational platform length under cover. The platforms are to accommodate dedicated seating, passenger information facilities, staff amenity facilities, station operational facilities and staff office.
- A one-way movement bus interchange with at least 12 active bus bays (10 standard 20m long bays and two 27m long articulated bays) and 6 bus layover bays including two articulated bays. The active bus bays are to be as close as practically possible to the station entry.
- Pedestrian priority crossing across the bus interchange, with landscaping design around the busway to be used to direct pedestrians to this designated crossing.
- Bicycle parking facilities, including a secure bicycle parking shelter and 10 U-rails adjacent to the station entry building. Provision must also be made for additional secure bicycle parking shelters to be added in the future.
- Landscaping to streets, forecourts and public open space on the PTA controlled land.
- A minimum of 500 car parking spaces, including a combination of long-term car parking (minimum of 450 bays), electric charging bays (minimum of 2 bays), accessible bays, taxi bays, short term 'kiss-and-ride' bays (minimum 26 bays), PTA staff parking (minimum 10 bays) and tenant parking. The car parking design is to be separated into two sections with approximately 122 car bays located to the north of the proposed rail line and the remainder to the south.
- A minimum of 10 covered motorcycle bays.

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

- The requirement to deliver a multi-modal station with bus interchange and rail station, with the bus interchange and rail station to be located to the west of The Parkway and Transit Way. The SWTC requires the station to incorporate an at-grade level island platform and station entry building.
- Station building specifications, including specifications for the paid and unpaid areas of the station. These specifications are:
  - Unpaid Concourse Area: requirement to provide access from the east to the unpaid concourse area of the station. The unpaid concourse area shall include, public service facilities, passenger ticketing/information facilities, station administration/office facilities, kiosk and associated stores. The public foyer area also requires a minimum ceiling height of 5.0m.
  - Paid Concourse Area: a requirement to provide public toilet facilities (male toilet, female toilet and unisex accessible toilet), staff amenity facilities (crib room, male toilet, female toilet, unisex accessible toilet and staff changing areas), station storage/cleaning facilities (cleaners room and store room) and direct to the adjacent platforms.
- A specification that the bus interchange includes a continuous canopy shelter between the bus interchange and station entrance, as well as weather protected seating at each bus stand.
- A requirement to provide accessible and direct pathways from all passenger transport infrastructure within the site boundary to the station entry.
- Various measures to ensure high quality landscaping is delivered, including the requirement for landscaping to be designed by a landscape architect and maximising the retention of remnant endemic vegetation.

The scope of works for the SWTC have been underpinned by patronage forecast modelling, which has assumed the following minimum patronage:

- Year 2026 - 3802 daily boardings;
- Year 2031 - 4351 daily boardings; and
- Year 2041 - 5172 daily boardings.

These figures will be tested by the consultant team through technical reporting where required, to ensure robust technical outcomes.

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 MELconnx Consortium 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.

### 3. Site Location and Context

#### 3.1 Lots Subject to this application

The legal details of the lots directly affected by works for the Ellenbrook Station and requiring development approval are detailed in **Table 1** and **Table 2** below.

Certificates of Title and Management Orders are enclosed within this application at **Appendix A**.

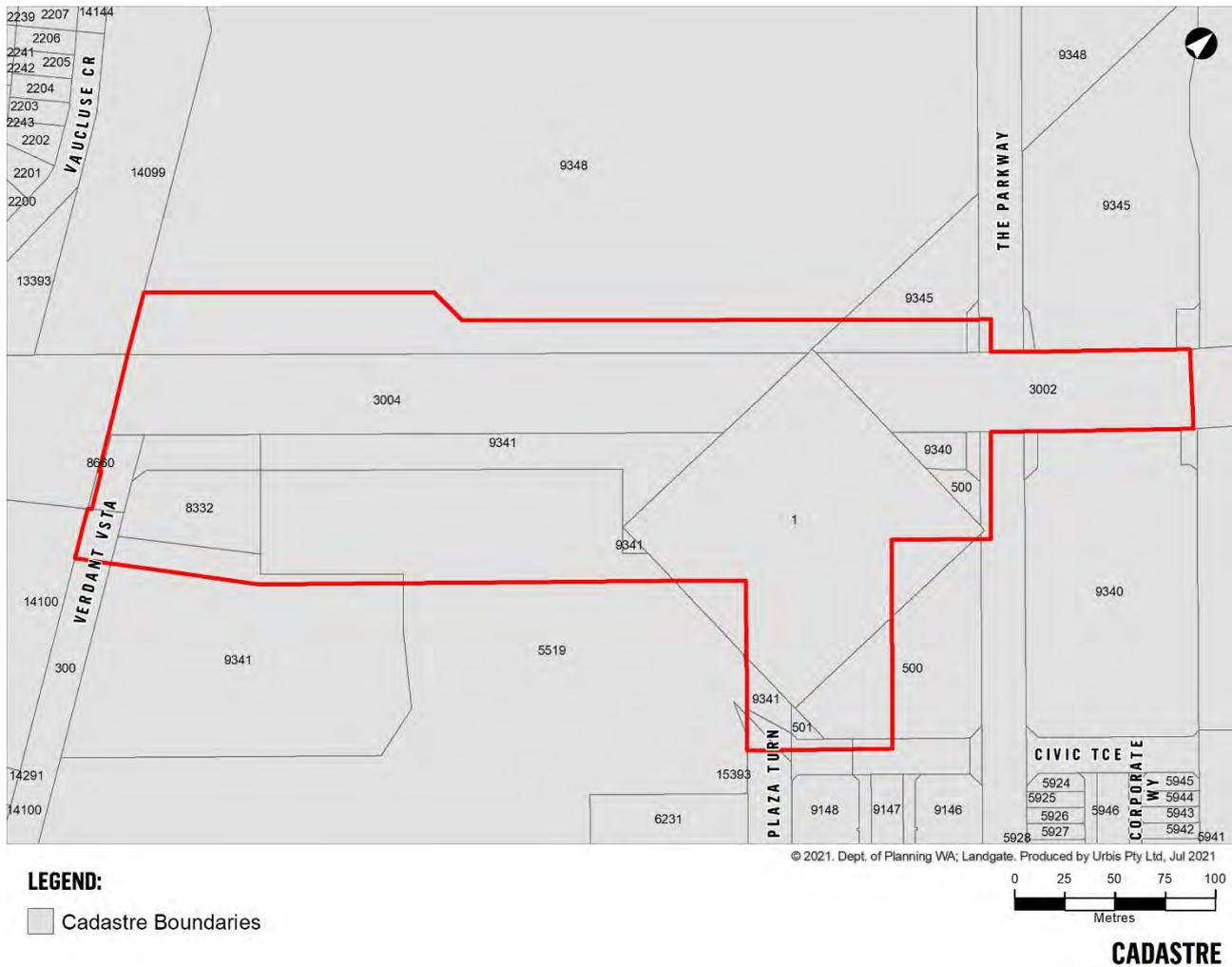
Table 1 – Affected Lots

Lot	Plan	Vol/Folio	Proprietor
9370	420153	4003/804	Housing Authority
9345	415969	2967/405	
9341	415100	2967/545	
3002	044081	LR3110/624 Reserve 48241 – Responsible Agency Department of Planning, Lands and Heritage	State of Western Australia
3004	45459	LR3163/162 Reserve 48241 – Responsible Agency Department of Planning, Lands and Heritage	
8660	400254	2834/465 (Dedicated Road)	
5519	406075	LR3167/176 Reserve 52644 – Responsible Agency Department of Planning, Lands and Heritage	
15393	38341	LR3133/377 (Dedicated Road)	
300	050955	LR3142/766 (Dedicated Road)	
1	64679	1647/704	
501	415089	2963/863	Western Australian Planning Commission
500	415089	2963/862	
8332	400254	2834/464	City of Swan

Table 2 – Affected Road Reserves

Land ID and Road Reserve	Proprietor
Land ID: 4085319. Verdant Vista Road Reserve.	Department of Planning Lands and Heritage
Land ID: 4083859.	
Land ID: 4118563. Transit Way Road Reserve	
Land ID: 4411899. Plaza Turn Road Reserve.	
Land ID: 4415745.	
Land ID:4284726. Civic Terrace Road Reserve	

Figure 2 – Cadastral Plan



### 3.2 Site Context

Ellenbrook Station will be located within the Ellenbrook Secondary Centre area. The Ellenbrook Secondary Centre as identified within State Planning Policy 4.2 and is an important source of service provision and employment for the local and sub-regional populations. Ellenbrook Station will be located approximately 21.5km north east of the Perth CBD.

As identified within **Table 1** and **Table 2**, the location of the Station is situated within a number of different land holdings. The Station is entirely located within Planning Control Area No. 144 (PCA 144) identified under the Metropolitan region Scheme (MRS). Refer to the 'Planning Considerations' section of this report where this is discussed further.

Ellenbrook station will be located south of an existing special use corridor which has been reserved since the early 1990s for future rapid transit. The rail alignment runs along this corridor between Gngangara Road and Verdant Vista. The station is offset to the south of this corridor to allow for a potential grade separated station and extension of the rail beyond Ellenbrook in the future with minimal disruption to existing services.'

Contextually Ellenbrook was a master-planned community through a Joint Venture with the State Government and private developer (LWP) which has grown substantially over the last 30 years into a satellite city of over 40,000. Through the planning for Ellenbrook, provision was made for rapid transit connection, with this reservation now enabling rail connection into the Town Centre.

As identified in **Figure 3** below, the land in which Ellenbrook Station will be located is primarily vacant.

Figure 3 – Current Aerial Photo

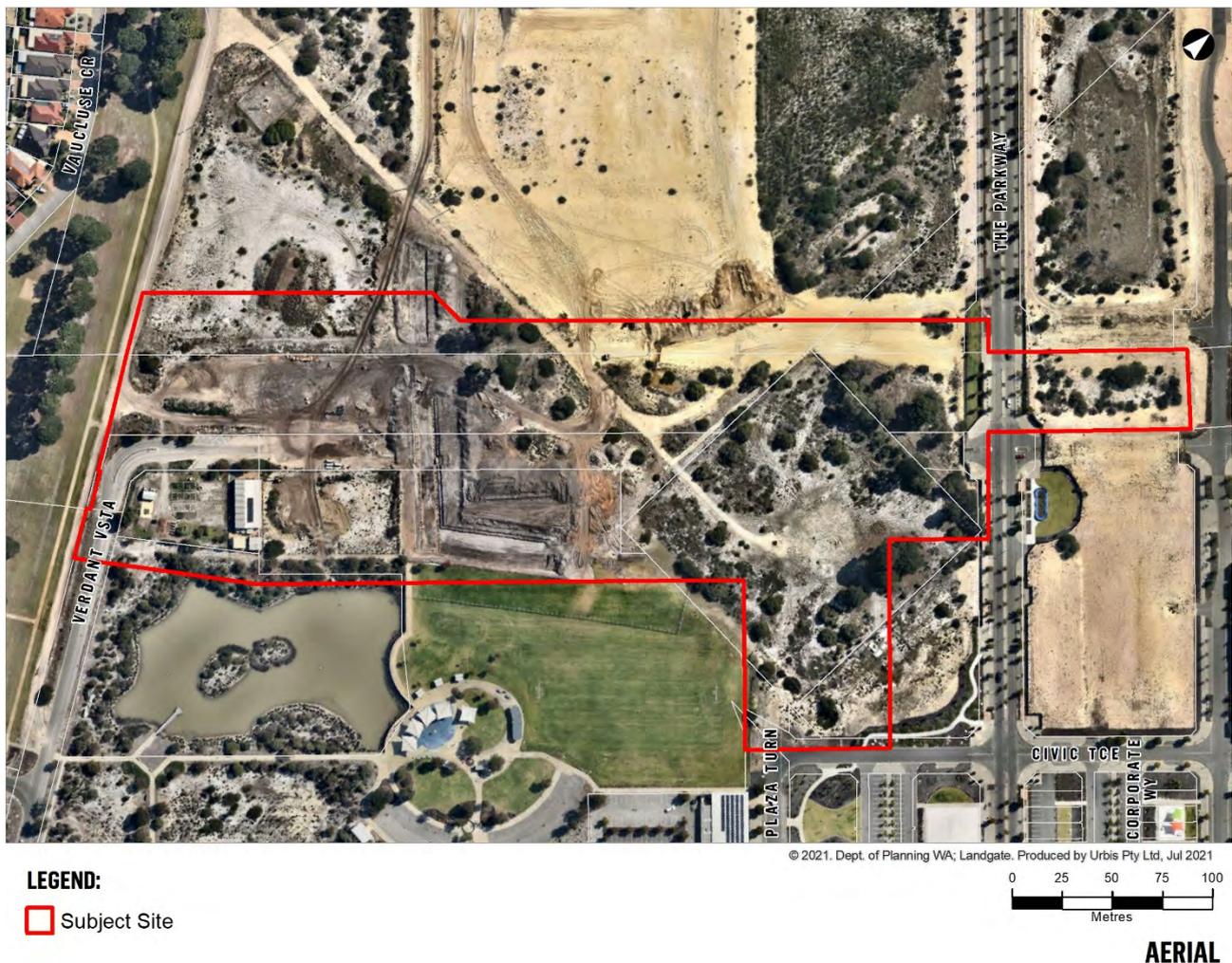




Table 3 – Contextual Summary

Contextual Feature	Details
<p>1. Ellenbrook Secondary Centre – Ellenbrook Central</p>	<p>The land surrounding Ellenbrook Station is primarily located within the Ellenbrook Secondary Centre. Specifically, Ellenbrook Central is located approximately 500m east of the proposed station.</p> <p>The Ellenbrook Secondary Centre was provided to service the growing North East Corridor, providing a range of services similar to a ‘Metropolitan Centre’ with a focus on local catchments. Ellenbrook Central currently provides for the retail and service needs of the broader catchment area with an emerging population on the broader surroundings. The centre was carefully designed and there has been a strong focus on urban design principles in its development.</p> <p>With continued population growth expected within the north eastern corridor, Ellenbrook Central is also expected to significantly expand its retail floorspace provision over the next few decades to potentially provide up to 100,000 sq.m of floorspace. This provision will see a 40% land use mix with a range of residential, community and commercial land uses.</p> <p>The establishment of Ellenbrook Station within the heart of the Ellenbrook Secondary Centre will contribute towards the centre achieving its intended function.</p>

Contextual Feature	Details
2. Drumpellier Drive	<p>Drumpellier Drive is located approximately 750m west of Ellenbrook Station. Drumpellier Drive is adjacent to an existing special use corridor in which the MEL rail alignment will be located.</p> <p>Drumpellier Drive and the special use corridor seek to improve road connectivity within the northern metropolitan corridor whilst also providing a vital rail corridor for the MEL alignment its and future extension.</p>
3. Tonkin Highway	<p>Tonkin Highway is located approximately 1.9km west of Ellenbrook Station. Tonkin Highway is recognised as a ‘Primary Regional Road’ under the Metropolitan Region Scheme. The highway provides important regional access to the north east corridor and transitions into the Great Northern Highway.</p> <p>The southern component of the MEL rail alignment runs within the Tonkin Highway road reserve for a distance of approximately 8km. This portion of the alignment will service Morley and Noranda Stations.</p>
4. Existing Residential Areas	<p>The land further north and south of Ellenbrook Station comprises primarily residential development. Ellenbrook is identified within the North-East Sub Regional Planning Framework as an area for continued residential population growth.</p> <p>The establishment of Ellenbrook Station and the MEL will assist in the service provision for the population providing essential connectivity to the CBD. Ellenbrook Station will also assist the Ellenbrook Secondary Centre fulfilling its role within the activity centre framework.</p>

### 3.3 Environmental Considerations

The following table provides a summary of environmental considerations applicable to the subject site, as well as proposed actions.

Table 4 – Summary of Environmental Conditions

Item	Summary
Bushfire Prone Areas	The Ellenbrook Station is <u>not</u> identified as a Bushfire Prone Area.
Contamination	The site is <u>not</u> an identified contaminated site.
Acid Sulphate Soils (ASS)	<p>The site and surrounds are identified as moderate to low risk of ASS occurring within 3m of natural soil surface but high to moderate risk of ASS beyond 3m of natural soil surface.</p> <p>Further geotechnical investigations and management will be undertaken as part of the construction management plan.</p>
Aboriginal Heritage	The site is <u>not</u> identified as a 'Registered Aboriginal Site' or 'Other Heritage Place'
European Heritage	The site does <u>not</u> contain any European heritage structures.
High Pressure Gas Pipeline	<p>The site is partially located within the APA and ATCO trigger distances, as identified under Draft Development Control Policy No. 4.3 – Planning for High Pressure Gas Pipelines.</p> <p>The proponent will consult with these agencies through the construction process to ensure the proposed works will not obstruct or danger this infrastructure.</p> <p>It is also noted that a number of lots contain an instrument on the title noting the land being within the DBNGP corridor. Preliminary advice received from the DPLH has confirmed that this land is surplus to pipeline requirements. As a result, these instruments should not form a barrier to receiving development approval, and MELconnx will continue negotiations with DPLH on the best approach to addressing these title instruments.</p>

## 4. Proposed Works

This development application seeks approval for the Ellenbrook Station, which is a multi-modal station accommodating the main station building and platforms, a bus interchange, car parking areas and pedestrian / cyclists links into the station. As will be detailed in later sections of this report, the majority of supporting infrastructure does not require development approval, so does not directly form part of this development application scope.

The Ellenbrook Station building will operate between 4:30am and 12:30am each day of the year, with the station to be locked outside of these hours to prevent the public from entering the station building. The supporting Ellenbrook bus interchange will also operate between 4:30am and 12:30am each day of the year. During the peak period of 7am – 9am and 4pm – 6pm, the station will provide six services per hour in each direction, reducing to 4 services per hour during off-peak.

The Ellenbrook Station has been off-set from the special use corridor to enable potential future expansion of the rail in the long term with minimal disruption to services. The purpose for this is to enable future proofing for a future extension of the rail line when this is required.

The Ellenbrook Station is proposed to be open for operation in 2024.

### 4.1 Station Works Subject to this Application

The Ellenbrook Station is designed as an 'at-grade' station, meaning the station building is constructed generally at level with the surrounding land. This station design is recognised to have merit for the Ellenbrook Station in that it reduces the amount of capital works and earthworks required to establish the station, but is still able to achieve integration with the surrounding land given the Ellenbrook Stations position as an end of line station.

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

- The station building, with a station entrance fronting The Parkway.
- A bus interchange immediately north of the station building, which includes 12 active bus bays for passenger pick-up/drop-off and associated shelter and seating. The busway will also contain 6 layover bays including 2 articulated bays, allowing buses to park between services and quickly recirculate as required.
- Station entrance building, which is security controlled for the Ellenbrook Station. This station entrance building accommodates the station concourse area with essential plant and amenities, including:

Passenger toilets, being 5 female toilets, 3 male toilets and 3 urinals and 1 universal access toilet.

Staff toilets and amenities, including 1 male staff toilet, 1 male shower, 1 female staff toilet, 1 female shower, 1 universal access toilet and a staff crib room.

Bin store areas, clearer rooms and kiosk area.

- A station platform of approximately 150m in length, accommodating typical station amenities such as seating and ticketing. The platform is weather protected for 70% of the platform, with a 0.75m clearance on each edge of the platform.
- Essential mechanical plant and electrical rooms to contain functional infrastructure.
- Two passenger and staff car parking areas located to the northwest and southwest of the station building, containing a total of 502 car parking bays. These bays are distributed as follows:
  - Park and Ride – a total of 487 bays including 13 short term bays, 10 secured bays for PTA staff and tenants, 2 bays with potential to be used as electric bays, 1 tenant bay, 10 ACROD bays, 2 service vehicle / loading bays and 4 open staff parking bays, with the remainder being standard all-day passenger bays.
  - Kiss and Ride – a total of 15 bays, comprising 13 standard pick-up/drop-off bays, 1 ACROD bay and 1 taxi bay.
- The Shared / Principal Shared Path, within the boundaries of the subject site (the remainder of the network is considered works which do not require planning approval).

- Landscaping, which broadly comprises:
  - Vegetation in the station forecourt and key pedestrian linkages. These areas will experience higher levels of pedestrian activity, both as a passageway and area to dwell. Amenity and comfort are therefore key to the success of these areas, with higher quality vegetation and larger tree species selected for these areas.
  - Vegetation at the periphery of the station, which are designed as basic low maintenance vegetation areas with smaller (100L) trees. The function of these spaces is to soften the appearance of the station and car parks, but to avoid dense vegetation coverage which may block sightlines.
  - Swale and basin planting within the central median of the car parking areas. These swales are designed as bioretention swales, with a layered structure to provide filtration and drainage. Vegetation selected for these areas are selected for their ability to cope with stormwater flow capture. Maintaining sightlines are also important in this area, resulting in the selection of 100L trees.
  - The majority of landscape species have been selected as local native species, as a deliberate attempt to reduce the long-term requirements for irrigation.

Development plans for the station work are provided at **Appendix B** of this report.

## 4.2 Supporting Works Exempt from Approval

The nature of this project will require a substantial component of infrastructure to support the functional operation of the station. For the Ellenbrook Station, this will require a number of supporting road connections / upgrades and rail related infrastructure which is considered exempt from the requirement of planning approval.

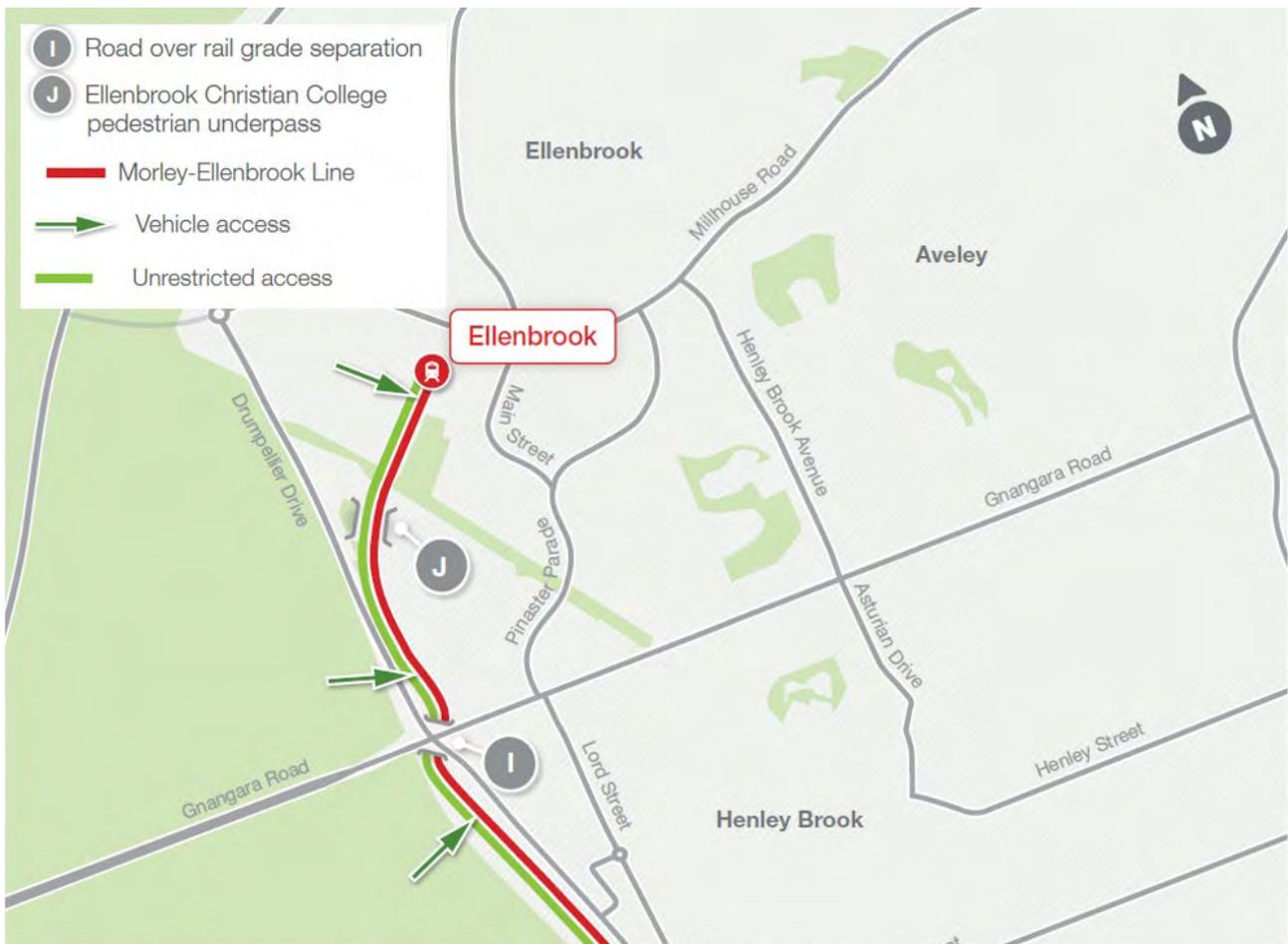
The following table outlines these supporting works relevant to the Ellenbrook Station, but which are not in the scope of the development application.

Table 5 – Supporting Works Outside of Scope

Works	Summary
Rail track	The rail track extension is considered operational, and does not provide vehicle or pedestrian access to the station. On this basis, the track is considered to not require approval.
Ellenbrook Christian College Underpass	An underpass to enable the continued access across the railway line for the Ellenbrook Christian College (east of Drumpellier Drive) will be delivered by the project team (refer to item “J” in <b>Figure 4</b> below). This underpass does not provide access to the station, and is therefore exempt works.
Gnangara Road Grade Separation Bridge	The MEL rail alignment will travel under the existing Gnangara Road alignment adjacent to where Drumpellier Drive intersects with Gnangara Road. This arrangement requires the realignment of Drumpellier Drive, and a subsequent shift of the intersection to the east. These works will not provide direct access to the station, so are considered exempt works (refer to item “I” in <b>Figure 4</b> ).
Shared / Principal Shared Path outside of the subject site	The MEL scope of works will generally fill gaps in the existing Shared / Principal Shared Path network. These connections are considered exempt from planning approval where they are outside of the ‘subject site’ as this is considered the point where the pathway does not provide ‘direct’ access to the station.

All operational infrastructure	All operational infrastructure is directly associated with rail operations are considered exempt from approval. For example, access tracks, monopoles, telecommunication towers, signalling structures, rail monopoles etc.
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Figure 4 - Ellenbrook Christian College Location Plan



Source: METRONET

## 5. Design Principles

### 5.1 Architectural Design Statement

The scope of works set by the projects SWTC includes a number of qualitative design measures which must be met in the station's architectural design. These requirements have been interpreted and applied by the project architects Woods Bagot, which has resulted in common linewide architectural themes and a site specific interpretation for Ellenbrook Station. These themes and design drivers are best summarised as follows.

#### Line wide Architecture Overview

The design approach for the Morley-Ellenbrook Line is to create a family of buildings tied together through a common design language to establish a line-wide identity. The approach is to have a degree of commonality between the five stations, however, also allow the stations to have unique elements to convey their own local identity and speak to the community in which they reside. Ellenbrook station is at ground level, Malaga and Whiteman Park are elevated and Morley and Noranda stations are on a highway, meaning they are all part of a line wide narrative but also have their own identity and unique elements. A 'kit-of-parts' approach has been taken to identify standardisation of components (where appropriate) to maximise efficiency of construction and maintain similar elements that informed a common language across all stations. Thus, Ellenbrook Station shares line-wide consistencies with the other stations on the Morley-Ellenbrook Line in terms of simple roof geometries, materiality, geometric form, kit of parts assembly and modular designs.

#### Ellenbrook Station Architecture

The Ellenbrook Station and precinct is located within the residential suburb of Ellenbrook and near the new Ellenbrook Town Centre. The design of the new precinct aligns with the existing town centre street grid and current networks. The Parkway serves as a future secondary main street in the broader Ellenbrook development, and correspondingly extends a formal, urbane character streetscape into this area in anticipation of future development that will consolidate the broader town centre experience for future residents and visitors.

The architecture of the station and the precinct design aims to deliver Ellenbrook station as a place that feels occupied and 'owned' by the community it services. This requires a sense of place with an authentic character that reflects its context and the local community's aspirations, making the place cared for, safer and activated. The station has a strong civic presence and scale, all the while set in a friendly and inviting landscape precinct.

The station is distinctive and of its location. The built form conveys a great sense of unique identity through its material quality and 'at ground' features. Ellenbrook Station is the only station on the line that is completely at-grade. The design facilitates visitors in an accessible and generous way, inviting them into the station and concourse area, enabling ease of flow between accommodation and out to the platform. Although civic in nature, the architecture is grounded with continuity between the Welcome Place, Concourse, and the station platform.

Of significant importance to the design team, is the consideration of how people will experience the station and the associated precinct in their day-to-day lives. The station building forms an integral part of the precinct and achieves a civic scale by the unique roof forms and the setbacks from the adjacent streets. The station, while civic in nature and scale, offers an intimate experience to the users, offering a welcoming and pleasant experience to the people transiting through the station. The precinct design is successful in offering the users, a perception of human scale, by employing three different elements - the main station roof, the canopies, and the arbour structure, with each of them being a smaller scale than the former.

The Welcome Place is the forecourt or 'community hub' of the station and is the place where people first experience the Town Centre of Ellenbrook after disembarking from the train. Of great importance, the Welcome Place articulates the community's sense of pride. The design of the Welcome Place is seamlessly and intuitively connected via strong axis and shade canopies to the various modes of transport including bus, vehicle, bicycle, and pedestrian pathways while also being nestled into a landscaped park that is both aesthetically and functionally welcoming. At Ellenbrook Station the Welcome Place is an inviting and safe space with seating, lawn, shade, wayfinding paths, canopies and secure bicycle parking. Lawn in the station welcome place creates a natural and informal meeting place for locals and visitors to dwell and connects the welcome place to the surrounding park and sports fields.

Upon entering the Station Building, visitors and staff will find accommodation units organised around a central pedestrian circulation foyer that provides access between the unpaid zone and the at-grade platform paid zone. For operational purposes, the unpaid concourse area includes public service facilities, Kiosk, and associated Stores. Accommodation wings are located on either side of the circulation zone, for efficiency of staff movement and access. The Station concourse is protected by the floating main canopy to provide a well-illuminated, generous space that is naturally lit and ventilated. The placing of all furniture, including lights and signage poles,

does not intrude into pedestrian pathways. There is a minimum obstacle-free width consistent with the footpath before and after concourse furniture. The station roof design has a strong connection with the concourse. It offers the visitors unique views while moving in either direction. The optimised width to the height ratio of the station roof has resulted in good amount of natural light throughout the concourse, enhancing the feeling of being outside, even in the concourse.

Some of the unique material elements of the Ellenbrook Station, such as face brick, roof colour, patterns and geometric form is reminiscent of the surrounding urban civic gestures and the local residential identity. Colours of terracotta, evident on roofs throughout Ellenbrook have informed the colour palette. Pine trees of the area inform the light toned roof soffits. Moreover, triangulated geometries, folded roof canopies and brickwork reflect the suburban roof profiles and character of Ellenbrook residences. Together, these material elements informed by the site narrative, endeavour to create an inviting, detailed development that feels homely and comfortable.

The detailed architectural statement provided at **Appendix H** of this report details these design drivers in detail.

### Approach to Built Form



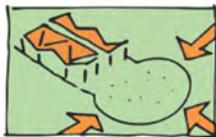
### Approach to Built Form



## 5.2 Station Precinct Design Principles

These architectural design measures outlined above underpin the functionality of the station precinct. **Table 6** provides detailed information on how these qualitative design measures have been interpreted and applied to the wider functional elements of the Ellenbrook Station design.

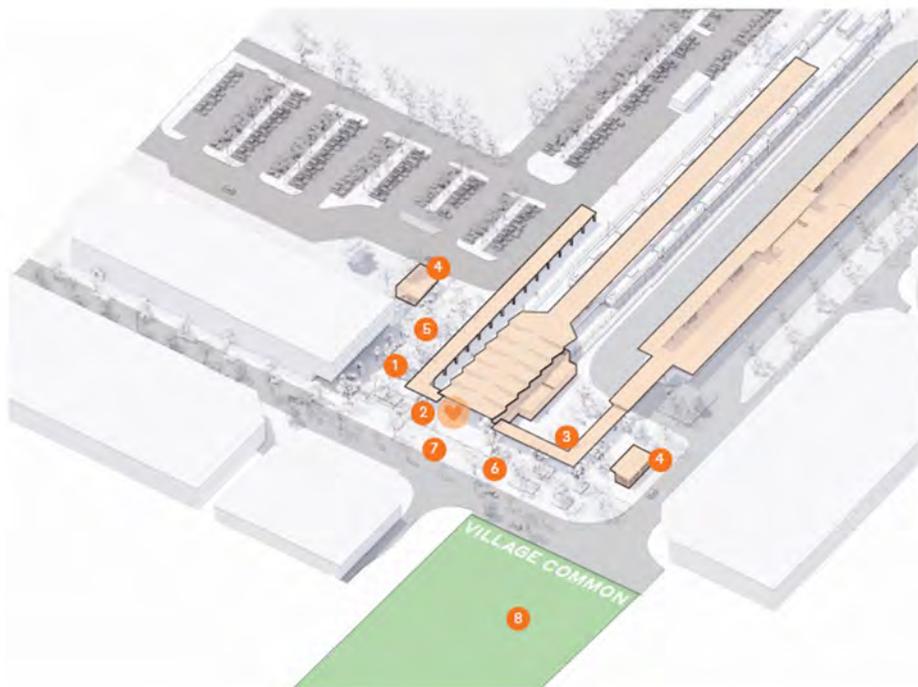
### Ellenbrook Station Precinct Overview



#### KEY MOVES

1. Expanded welcome place to create safe route to and from station parking
2. Welcoming and Legible station entry that is highly connected to surrounding infrastructure
3. Covered walkway embedded into welcome place landscaping from bus part to station entry.
4. Bicycle sheds split to logically connect with PSP routes on both sides of the Welcome Place / forecourt
5. Tree zone providing an entry experience and station identity, prioritising passenger over parking.
6. Welcome place as a park destination with a more civic formal approach.
7. Art attractor
8. Landscaped connection to the northern PSP

- Station Access and Movement
- Pedestrian / Cyclist Paths (PSP)
- Station Welcome Place



## Ellenbrook Station

### Pedestrian Connectivity to Wider Networks

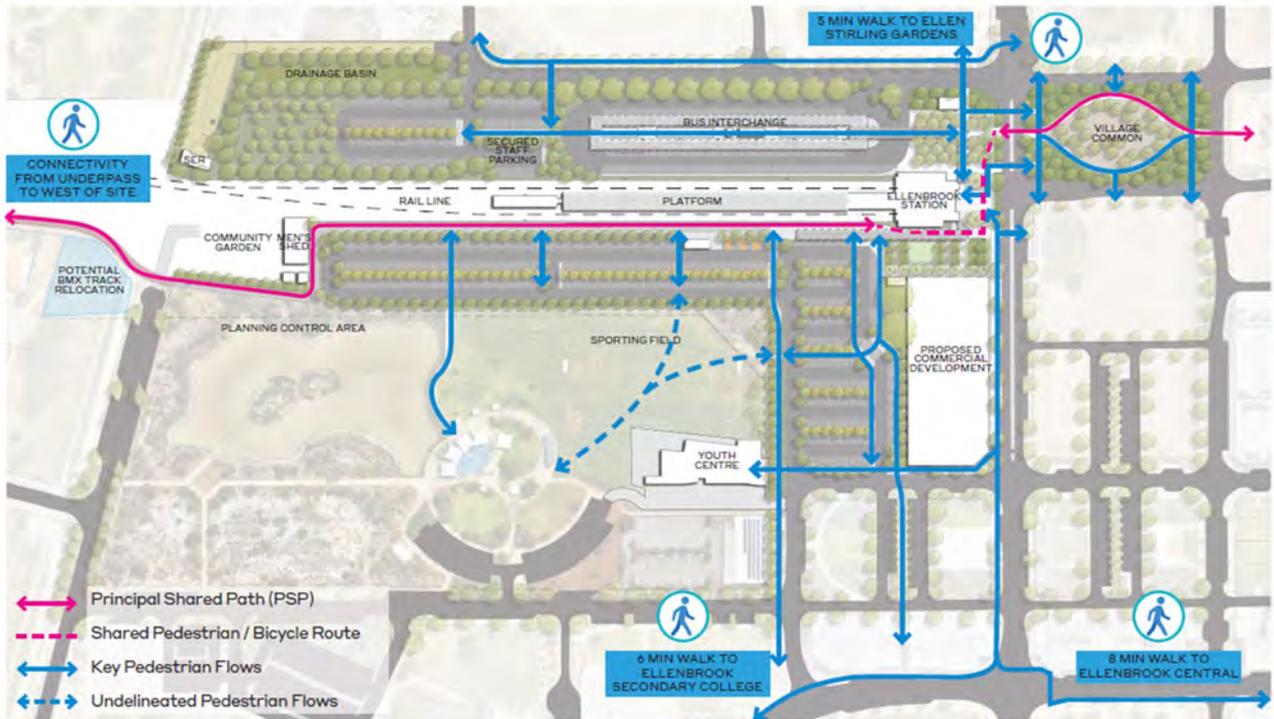
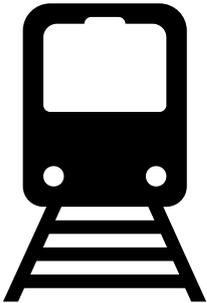


Table 6 – Proposed Works for Ellenbrook Station

PROPOSED	DETAILS
<p><b>Train Station Form and Functionality</b></p> 	<p>The Ellenbrook Station is the ‘end of the line’ station for the MEL alignment. This situation enables the station to adopt an ‘at-grade’ station form, without compromising accessibility. This station form is recognised to provide the least disruption to the natural ground plane, and is often the least expensive to construct.</p> <p>This is beneficial to the overall station layout, as it enables a station entrance to be established at street level in a simple but intuitive form, without the disruption of the rail. In this respect, an end of line ‘at-grade’ station achieves many of the benefits of a ‘cut-and-cover’ or ‘underground tunnel’ station, but without the significant earthworks constructions.</p> <p>In terms of layout and configuration, the train station provides a single main station entrance to the east façade, leading into the station entry building and station platform. Approximately half of the station platform will provide a sheltered waiting zone, and will contain typical station facilities such as seating and passenger information / ticketing.</p> <p>Ellenbrook is a access controlled station, meaning the majority of the station entrance and platform are fare controlled with access gates. The station building is central to the overall precinct, channelling pedestrian movements into this single entrance point.</p> <p>Consistent with all PTA infrastructure, the station building will be designed to universal access standards.</p>



<p><b>Station Parking</b></p> 	<p>500 car parking bays are provided for staff, patrons and supporting services of the station.</p> <p>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 still enables patrons to undertake incidental multi-purpose trips within the Ellenbrook town centre combined with their commute.</p>
<p><b>Landscaping</b></p> 	<p>High quality hard and soft landscaping design has been proposed for the Ellenbrook Station. The key principles underpinning the landscape design are as follows:</p> <ul style="list-style-type: none"> <li>• Practical tree retention, trees being retained or relocated were possible as part of the landscape plan.</li> <li>• Use of low maintenance vegetation species. This is achieved by using local natural species (such as Banksia, Eucalyptus and Melaleuca varieties) where possible, supported by exotic species only where specific vegetation characteristics are required.</li> <li>• Water reduction through species selection. Species which do not require long-term irrigation have been selected for the majority of the station landscaping. Specifically, approximately 11,500sq.m (86%) of landscaped areas will not require irrigation once established.</li> <li>• Reduction of heat island effects, specifically:             <ul style="list-style-type: none"> <li>○ Planting large trees within the station forecourt, with a mix of grouped medium sized trees (500L) and large feature trees (1500L) providing shading and relief to the paved forecourt space.</li> <li>○ Planting within central swales in car parking areas and along the periphery of the car parking areas.</li> </ul> </li> <li>• 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 the busway to achieve a distinctly different feel to the thoroughfare areas.</li> <li>• Large quantities of seating is required, but must be delivered in a manner which minimises obstruction to key movement areas. In-situ seating incorporated into raised planters will be applied where possible to achieve this.</li> </ul> <p>The key challenge for the station landscaping is maximising canopy coverage whilst also ensuring vegetation does not restrict CCTV coverage. As a result, the landscaping design focuses widespread tree coverage around the periphery of the station precinct, with planting in the station forecourt focussed on quality feature planting.</p> <p>The landscape plan is provided at <b>Appendix C</b> of this report.</p>

## Ellenbrook Station Landscape Aesthetics



## Ellenbrook Station The Arbour



Visitors to Ellenbrook Station will be greeted by an arbour form, a form that aids in breaking the edge of the built form before the street edge. The Arbour form shall speak of the surrounding context of the Swan Valley; its regulated vineyard layouts and creeping green vines.

This element softens the street condition and seeks to be another "attractor piece" and entry point for those catching the train. This gateway element entices people through its form and into the welcoming condition of the station.

"The design of **The Arbour** breaks the edge of the built form and softens the entry into Ellenbrook"



**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 'Village Common' open space area is located immediately adjacent to the station entrance. This configuration provides for direct sightlines between the two spaces, enabling mutual surveillance opportunities.
- The station car parking areas are configured as smaller parking cells (rather than large expanses of bays) with central planting areas and kerbing to discourage anti-social driving behaviour.
- The station platform, bus interchange and car parking areas are in linear alignment, providing for information surveillance between the station platform and adjacent areas.
- Future development land parcels are integrated with the station. These sites are likely to be developed with higher density built form, with opportunities for passive surveillance over the station.

**Ellenbrook Station CPTED**



**Lighting**

Provide adequate illumination of a space both during the day and at night which enables people to see and be seen

Integrated initiatives

- Lighting standards & levels
- Spacing
- Type
- Site and Situation



**Sightlines**

Provide maximum visibility of the immediate and approaching surroundings by creating an unimpeded view across pathways

Integrated initiatives

- Passive surveillance
- Direction of pathways



**Ownership**

Generate a sense of proprietorship amongst owners and users of a space, to encourage people to take responsibility for that space and protect it

Integrated initiatives

- Clear border definition
- Surface treatments
- Transitional zones
- Management and maintenance



**Entrapment**

Avoid entrapment spots, particularly adjacent to pedestrian routes, a predictable/unchangeable path or a dead-end

Integrated initiatives

- Eliminate entrapment spots
- Limit access if entrapment is unavoidable



**Movement Predictors**

A predictable or unchangeable route or path that offers no choice to pedestrians

Integrated initiatives

- Eliminate movement predictor routes
- Provide access to alternate routes



**Wayfinding**

Enable the environment to convey a sense of place and provide orientation and direction, including an indication of safe places and routes

Integrated initiatives

- Signage
- Legibility
- Features



**Landscaping**

Increase the safety of a site by transforming the overall landscape, through the use of vegetation

Integrated initiatives

- Selection of plants
- Clear trunk trees with lifted canopies
- Low understorey planting
- Layered planting with lows species adjacent paths

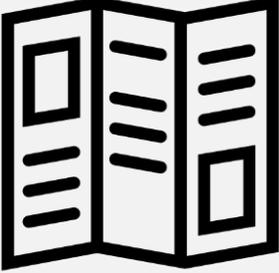
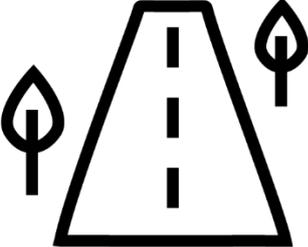
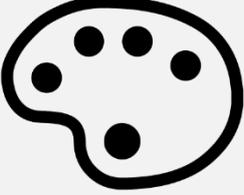


**Activation**

Modify the range of land uses in a space in order to facilitate an appropriate mix of activities occurring in the environment

Integrated initiatives

- Gathering areas
- Compatible and balanced use of space

<p><b>Supporting Bus Services</b></p> 	<p>To deliver an integrated transport solution which connects the key activity areas within the rail extension area, a comprehensive and supportive feeder bus network will be delivered. 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.</p> <p>The bus services will increase the number of passengers arriving at the Ellenbrook Station via public transport and reduce demand for station car parking.</p> <p>It is expected that feeder bus services will build on the existing bus network by adjusting services to connect to the new stations, creating loops between stations and local and regional destinations. 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 and expected to be completed 12-18 months before operations begin.</p>
<p><b>Supporting Road Works</b></p> 	<p>The scope of works for the MEL alignment will include the construction of some roads which are essential for the operation of the station. In the case of Ellenbrook Station, the scope of works will include the construct access roads into the station from Verdant Vista, as well as the physical construction of the road within future Cussington Way.</p> <p>Cussington Way will ultimately form a public road, and is part of a wider planned subdivision to the north. The creation of this road will ultimately require subdivision approval, which will be coordinated as a separate process. Importantly, Cussington Way is expected to be created as a public road prior to commencement of station operations.</p> <p>The Ellenbrook Station scope of works will also include the construction of a new access driveway and car parking for the men’s shed within Lot 8332, due to the existing access being removed for the station. This will include the construction of 20 bays within Verdant Vista. Given these works occur within the designated Planning Control Area, but are not directly station works, it is important that these minor supportive access works are included in the scope of the development application.</p>
<p><b>Public Art</b></p> 	<p>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.</p> <p>This artwork will be delivered to be consistent with the themes of the wider ‘METRONET Public Art Strategy’, with the thematic framework strongly built around the Gnarla Bidji story of ‘Our Pathways’.</p> <p>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.</p> <p>A detailed public art plan including themes and opportunities for the MEL alignment and Ellenbrook Station is provided at <b>Appendix I</b> of this report.</p>

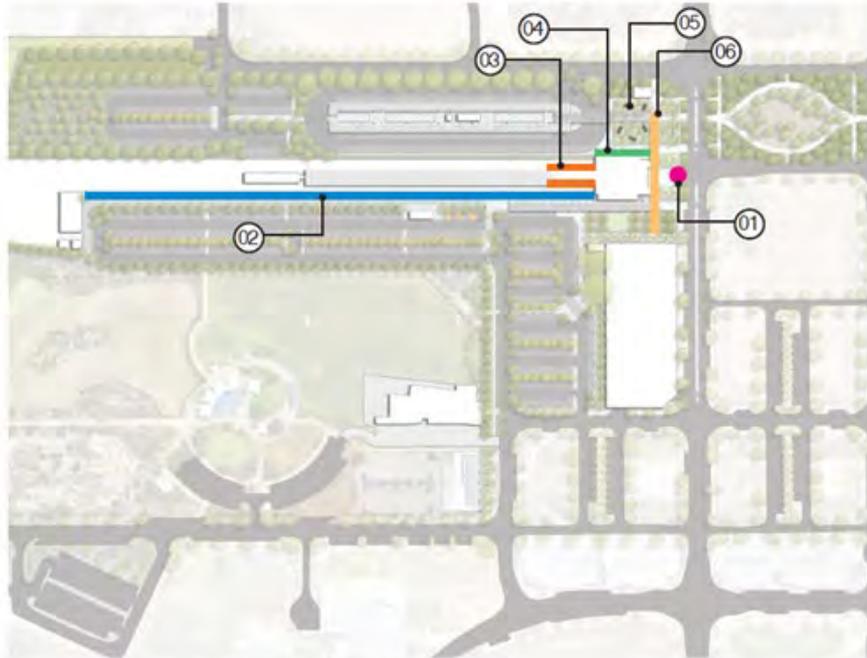
## Ellenbrook Station

### Public Art Integration Strategy



#### Areas of Opportunity

- 01 Landmark Artwork at Welcome Place entry
- 02 Fence along edge of rail line
- 03 Interior waiting zone
- 04 Services exterior wall
- 05 Informal sculptural seating
- 06 Engravings in paving



## Ellenbrook Station

### Public Art Integration Strategy



#### Ellenbrook Themes:

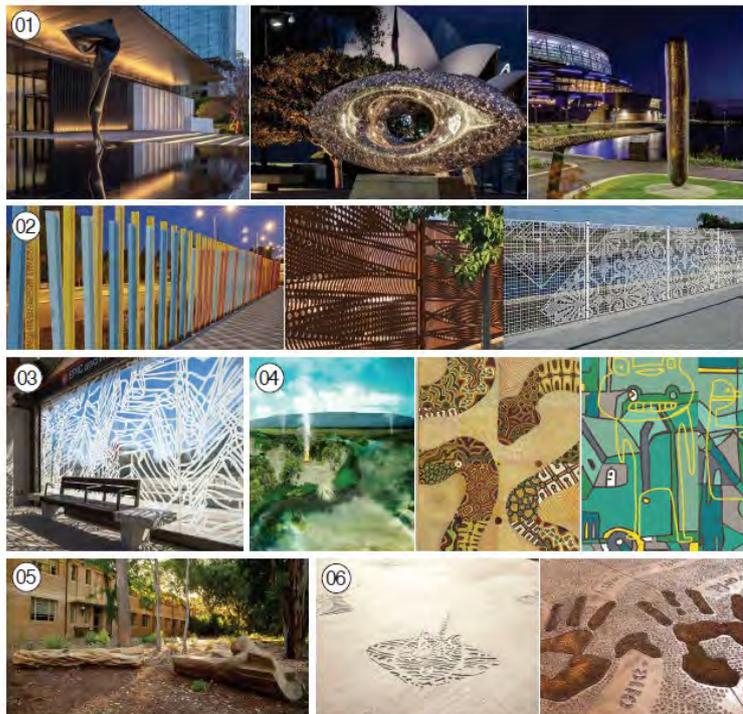
- Story of Yagan
- Start of the Journey

#### Linewise Themes:

- The Six Seasons
- Interpretation/stories from cultural context
- Dual Naming

#### Areas of Opportunity

- 01 Landmark Artwork at Welcome Place entry
- 02 Fence along edge of rail line
- 03 Interior waiting zone
- 04 Services exterior wall
- 05 Informal sculptural seating
- 06 Engravings in paving



### 5.3 SPP 7.0 – Assessment of Good Design

MELconnx have referenced the 10 Principles of Good Design, outlined under, ‘State Planning Policy 7.0 Design of the Built Environment,’ to develop an appropriate design response and sense of place for the station and precinct design. Table 7 below provides detailed information illustrating the measures incorporated to achieve a high quality design and built form outcome.

Table 7 – SPP 7.0 Design Assessment

Principle	Statement	Response
Context and Character	<i>Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.</i>	<p>Inclusion of distinctive characteristics, prominent natural and built features, local civic gestures and distinctiveness, intended future character and civic identity.</p> <p>Engagement undertaken with Whadjuk Noongar culture and the Gnarla Bidji has informed the station design. Input from an indigenous consultant has strengthened the narrative for the station precinct design to promote a strong user awareness of being on Whadjuk Noongar land.</p>
Landscape Quality	<i>Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.</i>	<p>The qualities of Ellenbrook have been reflected in the landscape design ensuring an identity to Place, including the use of materials, arbour structures, planting, artwork, rectilinear layout, and a strong civic quality.</p> <p>The landscape planting strategy has a strong emphasis on native species, with native vegetation threading through suburbia across the whole line.</p> <p>The irrigation strategy supports a combination of temporary and permanent irrigation depending on the location - with the Welcome Place and adjacent streetscapes proposed to be irrigated on a permanent basis. Car parks are proposed to utilise temporary irrigation in combination with WSUD swales and a calibrated local-native, waterwise planting scheme.</p> <p>All planted areas are proposed to have appropriately designed soil profiles and improvements to aid with water retention and plant development. The Village Common and associated verges are proposed to be irrigated off the Ellenbrook Town Centre permanent irrigation supply in accordance with the city guidelines.</p>

<p>Built Form and Scale</p>	<p><i>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.</i></p>	<p>A unique identity, response to landforms and existing built fabric, coherent local identity, articulation of built forms.</p> <p>The simplicity of the built form of the station has the potential to deliver the required presence. The architecture responds to a more intimate and human scale, characterized as a welcoming presence and a pleasant approach to the people transiting through the station. The scale of the roof assists in delivering a strong civic sense and further the connection with the immediate context.</p>
<p>Functionality and Build Quality</p>	<p><i>Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full lifecycle</i></p>	<p>Quality robust materials, flexible and adaptable spaces, future proofing, station functionality and serviceability/maintainability &amp; integrated services.</p> <p>Clean internal spaces provide a good basis for the architectural approach. The planning of internal spaces is consistent between stations and has been constrained by spatial requirements.</p>
<p>Sustainability</p>	<p><i>Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes</i></p>	<p>The principles of the Metronet sustainability strategy have been incorporated in the design, including social sustainability by providing connectivity, amenity, resilience and adaptability. It is also a sensitively designed environment that considers biodiversity, water and the local climatic conditions providing optimal shading and natural vegetation.</p> <p>The WSUD principles, include the swales and drainage conditions in the carpark. Delivery of the landscape on scheme water with careful and targeted use of irrigation in combination with appropriate water species selection is considered critical to the success of the station precinct as high-quality public realm.</p>
<p>Amenity</p>	<p><i>Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.</i></p>	<p>Spaces have been designed to be welcoming and comfortable, universally accessible with good levels of natural daylight and natural ventilation</p> <p>The Welcome Place will be an engaging landscape setting commensurate with its primary role as a transition space from the surrounding town centre to a significant piece of transport infrastructure. It will provide an engaging public realm experience through the introduction of public art and feature lighting (proposals under development), provision of free wifi and is well appointed with an array of seating options and supporting amenity such as architectural canopies and arbour structures, drink fountains, advanced trees and supporting urban</p>

		<p>furniture and functional lighting. Each of the three proposed arbour structures are complemented by seat-walls immediately underneath.</p> <p>Access to shade, sun, and rain shelter is considered in the distribution of seating amenity. All seats under the arbour are located under the southern edge for maximum shade, and all other seats are under a generous number of advanced trees throughout the Welcome Place. This is aided by the architectural canopies from the bus interchange and 'Kiss &amp; Ride' to the train station.</p> <p>Bins are located along desire lines but not in locations that are too conspicuous. Drinking fountains are also located along desire lines for ease of use. Bike racks are located near the station entrance but off to the side to avoid visual clutter or conflict with pedestrian movements.</p> <p>It is anticipated that food and beverage opportunities may be incorporated into the commercial development lot immediately adjacent to the east of the Welcome Place.</p>
<p>Legibility</p>	<p><i>Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.</i></p>	<p>The station building is the central identifiable element with clear sightlines from all modes of transport to and from the building. There is a clear hierarchy of architectural elements from the larger station building to lower canopies that assist wayfinding and provide identifiable elements. Landmark structures within the Welcome Place such as public art and arbour structures provide further legibility to the station entrance and forecourt. This is further enforced by clear pedestrian and cycling connectivity to wider networks, with path connections focusing on desire lines.</p>
<p>Safety</p>	<p><i>Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.</i></p>	<p>The fundamentals of CPTED have been integrated into the design, including lighting, clear sightlines, clear ownership and boundaries, elimination of entrapment spots, elimination of movement predictors, legible wayfinding, landscaping, and activation.</p> <p>All landscape areas are on grade except an area of raised lawn in the Welcome Place (raised to a height of approximately 500mm above adjacent grades), which does not obstruct lines of sight in any way. CPTED issues are considered, ensuring clears</p>

		<p>sightlines in all areas between 700mm and 2000mm above pavement level.</p> <p>In addition, the precinct, (except for the Village Common) will be monitored by 24/7 CCTV surveillance. CCTV viewsheds have been modelled to assess impacts of tree development over time to ensure sufficient surveillance coverage</p>
Community	<p><i>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.</i></p>	<p>The Ellenbrook Station, Welcome Place and Village Common have been designed as an important connection and outset to surrounding open spaces, sporting amenities, educational facilities, and retail.</p>
Aesthetics	<p><i>Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.</i></p>	<p>The design aims to be an attractive and welcoming station and precinct that is unique to Ellenbrook. Public art, aboriginal culture, local materiality and local elements integrated into the architecture and landscape giving it a clear sense of place and character.</p> <p>The surrounding residential context has inspired brick as a material for the Ellenbrook station. Ongoing investigations continue to explore brick types, bonds, joints etc and a decision will be taken after mock ups have been assessed.</p> <p>Integration of a lighting track to the soffit and further detailing of the soffit cladding will occur as part of the detailed design stage. The aim is to ensure a clean and simple aesthetic which reads well, and further connects with the canopies and other roof geometries in the precinct.</p> <p>Refinement of the accommodation building and the service building has been undertaken to keep the facades minimal and let the character of the building come through with the materials and detailing.</p>

## 6. Technical Reports

### 6.1 Acoustic Report

A preliminary Acoustic Report is provided at **Appendix D** of this report. The key points identified within the Acoustic Report are noted below.

- Overall environmental rail noise levels, when assessed at nearby potential noise sensitive premises are expected to comply with applicable state noise regulations and planning policy. Rail vibration levels are expected to be compliant with recommended levels.
- Noise from car parking areas, local vehicle traffic and bus movements will increase significantly in the area from current conditions, but are expected to remain compliant with relevant state policies.
- Car parking areas should avoid the use of speed humps, loose laid road coverings or smooth concrete surfaces to minimise noise emissions.
- Design of the station plant and facilities such as mechanical services, public address and crowding areas to meet applicable environmental noise regulations may be achieved through conventional / industry standard design approaches and therefore is not anticipated to require specialist design input.

Stations on the Morley Ellenbrook Line (MEL) Project are required to meet the following acoustic requirements:

- Scope of Works and Technical Requirements (SWTC) Book 4 – Technical Criteria Section 13.7.
- Green Star Design and As-built Requirements for Railway Stations (v1.1) Credit 14.

The above key requirements will formulate the basis for detailed acoustic design to ensure that Ellenbrook Station arrives at an acceptable and compliant acoustic outcome. Importantly, the acoustic design of the station office spaces, concourses and platforms should sufficiently address the project requirements. This will involve:

- Sound absorption within offices, cribs and tea rooms.
- Sound insulation between spaces.
- Control of noise associated with services and other fixed infrastructure.
- Maintain desired reverberation levels and careful speaker positioning to retain speech intelligibility of the Public Address (PA) system.

Specific construction advice in line with the architectural intent will be provided during the design and coordinated with other technical disciplines to ensure compliance with SPP 5.4 – Road and Rail Noise.

### 6.2 Transport Impact Assessment

A Transport Impact Assessment (TIA) is provided at **Appendix E** of this report. This TIA considers the Ellenbrook Stations impact on the wider transport networks, including consideration on the areas existing and future transport context, changes to the transport network and integration of surrounding land uses.

Given the nature of the development, the assessment has also considered and forecasted the expected passenger boarding's, resulting in the following estimated patronage:

- Approximately 3,800 boarding's a day at opening year (assumed 2024)
- Approximately 5,200 boarding's a day by 2041

These numbers generally align with the patronage estimates outlined in the SWTC, indicating the TIA modelling is based on sound assumptions.

Given transport orientated development and encouraging alternative modes of transport is a key principle underpinning the Ellenbrook Station, active transport modes and bus feeder services have been given higher weighting in the modelling. Specifically, the following weightings underpin the assessment:

- Active transport modes (walking, cycling) – approximately 60% of patronage
- Bus feeder services – approximately 26%
- Private vehicle – approximately 17%

Given the Ellenbrook Station is located within the Ellenbrook activity centre, these modelling assumptions are key to encouraging the shift to alternative modes of transport, which is widely accepted as best practice transport planning within activity centres. But it is noted that delivering these outcomes relies heavily on supporting transport infrastructure and management practices to be delivered by the City, including:

- The prioritisation of the cycle infrastructure proposed in the *City of Swan Cycle Network Plan*; and
- Supporting parking management measures within surrounding streets.

The TIA concludes that the traffic generated by the station does not result in major impacts to the surrounding network, and the station will be well serviced by the existing and proposed upgrades to the surrounding transport network, as well as facilitating safe and convenience access for pedestrians, cyclists, buses and general vehicles.

Specifically, the following notable outcomes are drawn from the assessment:

- The station's peak AM and PM periods are estimated to generate a total traffic generation (combined inbound and outbound) of 865 and 459 movements respectively.
- The resultant SIDRA analysis provides the following outcomes for the opening year and 10 year scenario:
  - Opening Year: The network performs within capacity, with an average of LOS B during peak periods, and no queuing overflow. The worst case scenario is LOS D for the Main Street / The Parkway intersection during peak period, which indicates a slight increase in delays but remains an acceptable traffic outcome.
  - 10 Year Scenario: The network continues to perform within capacity with a worst case scenario of LOS D. The modelling notes that queuing overflow occurs in some limited instances during the peak period causing some additional delays for vehicles entering the station, but overall practical capacity remains in the network.
- Overall, the SIDRA results indicate that the Main Street / The Parkway intersection operates within practical capacity, with an average of LOS B during both peak periods.
- The Main Street / Plaza Turn intersection operates at an acceptable LOS, but with queuing issues emerging in the 10 year scenario. The TIA recommends the use of 'KEEP CLEAR' line markings to mitigate potential queuing, which will be further investigated at detailed design, in consultation with Main Roads.
- Swept path analysis has been completed based on the largest vehicle expected to access the respective areas, which includes assessment of service / emergency vehicles and buses.

### 6.3 Stormwater Considerations

A preliminary stormwater design is provided at **Appendix F** of this report. The key principles underpinning this design are as follows:

- Stormwater runoff from the station is captured, conveyed and discharged into sub-catchments, designed to detain the 10% AEP storm event.
- The central areas in car parking areas are utilised as a bioretention swale, with parking areas surrounding this graded towards the swale areas. These swales are designed to store the 10% AEP storm event with approximately 400mm ponded depth. A combined area of approximately 1,644sq.m is provided as swales and basins.
- Stormwater collected from the bus interchange will be captured in a traditional pit and pipe network and is intended to be conveyed to the City of Swan future basin immediately north west of the subject site. This basin is depicted in the Ellenbrook Town Centre Masterplan Drainage Strategy.
- Stormwater collected from the station will be captured and conveyed into discharge locations east of the station building (subject to further detailed design).

The preliminary stormwater design is provided to indicatively demonstrate water management design principles. The final stormwater design is expected to be delivered as a condition of approval, similar to previous METRONET station projects. Specifically, the following condition has generally been applied to previous METRONET station development approvals:

*A Drainage Management Plan shall be submitted and approved by the Western Australian Planning Commission, on the advice of the Department of Water and Environmental Regulation and the City of Swan, prior to the commencement of relevant building works. Once approved, the plan is to be implemented in its entirety.*

## 7. Exemptions Legislation and Considerations

As noted within earlier sections of this report, the majority of the infrastructure supporting the Ellenbrook Station is outside the scope of this development application, on the basis that the works are considered exempt. The following sections outline the head of power which underpins these exemptions.

### 7.1 Section 6 Public Works

Section 6 of the *Planning and Development Act 2005* 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 meets the definition of 'public work' as defined by the *Public Works Act 1902*.

The PTA is considered an 'Agent of the Crown', and the MELconnx 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 Ellenbrook Station works are included within the scope of the METRONET Act enabling legislation, the proposed works also meet this second test.

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

### 7.2 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 MEL. 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 MRS. 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 Metropolitan region Scheme will apply.

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.

### 7.3 Metropolitan Region Scheme (MRS) Exemptions

The site is identified within Public purpose – special uses reserve and Urban zone under the MRS – refer to Figure 5.

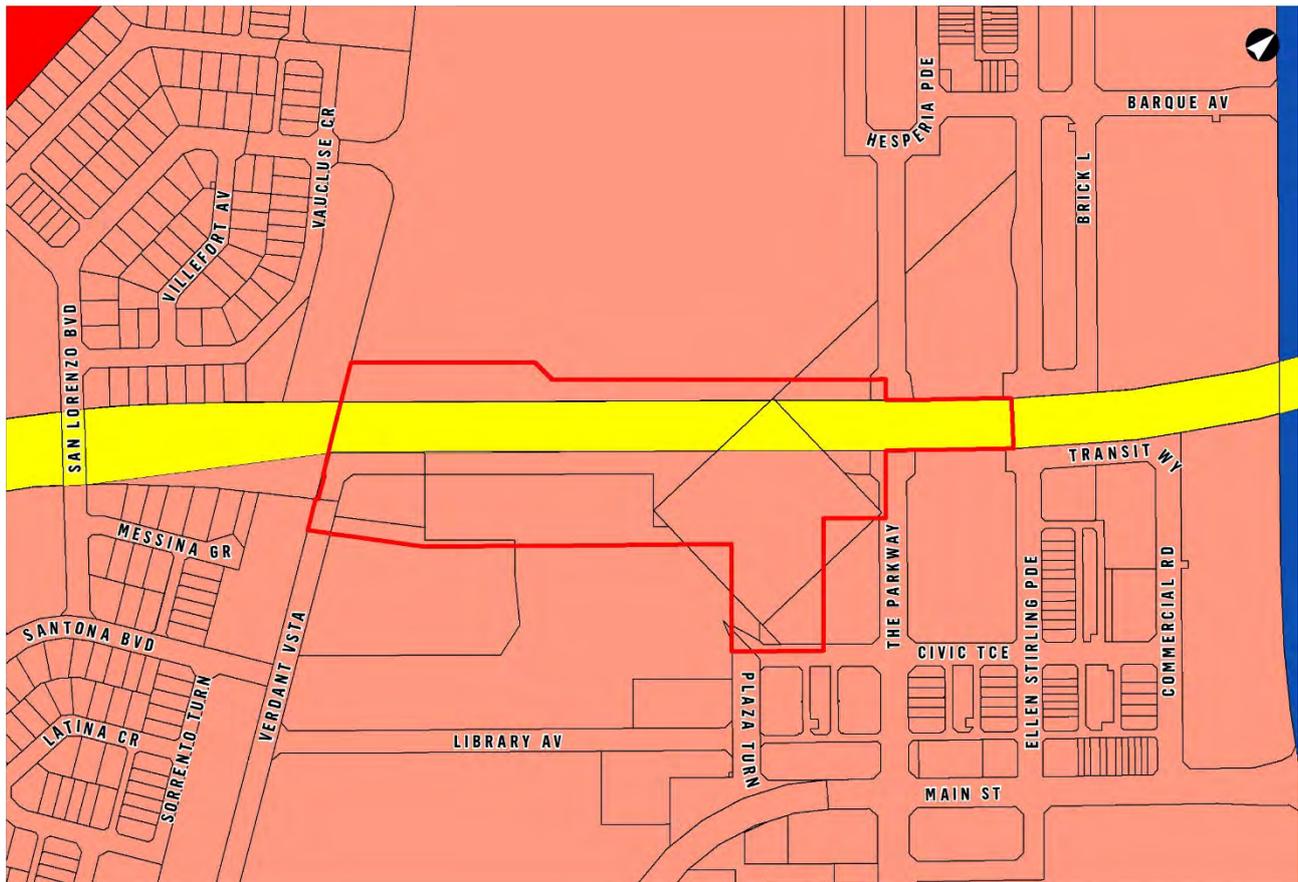
Exemptions available under the MRS are provided through the following clauses:

- Reserved Land: Clause 16(1a), where the development is 'Permitted Development' or expressly authorised under an Act to be commenced or carried out without the approval of the WAPC.

- Zoned Land: Clause 24, which broadly enables a public authority to complete works in a local road. However in accordance with section 24(2)(a) of the Planning and Development Act, this exemption does not extend to development within a PCA.

Under Section 24(2)(a) of the MRS, 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. This means that the MRS does not provide any exemptions from planning approval for **zoned land**. However, for this METRONET project, the enabling legislation of the METRONET Act re-instates the majority, but not all, of these exemptions.

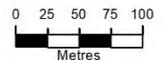
Figure 5 - MRS Map



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**LEGEND:**

- |   |  |  |
|---|--|--|
| <span style="border: 1px solid red; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Subject Site          | <span style="background-color: orange; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Existing Region Scheme Reserves   | <span style="background-color: red; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Primary regional roads |
| <span style="background-color: blue; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Other regional roads | <span style="background-color: yellow; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Public purposes - special uses SU | <span style="background-color: orange; display: inline-block; width: 15px; height: 15px; margin-right: 5px;"></span> Urban               |



**REGION SCHEME**

## 7.4 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.

In the case of Ellenbrook Station, as the future station land is not zoned 'Railways' under the MRS, the key legislation guiding exemptions is the METRONET Act. The below table provides a summary of how the exemptions have been applied to the station.

Table 8 – Summary of Exemptions

MRS Zone / Reservation	Exemption	Conclusion
'Public Purposes – Special Uses' & 'Urban' zone	<p><i>Despite anything in the Metropolitan Region Scheme, the following development may be commenced or carried out without the approval of the Planning Commission —</i></p> <p>...</p> <p><i>(B) METRONET works on non-railway land.</i></p> <p>'METRONET Works' are defined as:</p> <p><i>means works for the purpose of, or in connection with, a METRONET railway but 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;</i></p>	<p>The conclusion drawn from this clause is as follows:</p> <ul style="list-style-type: none"> <li>Station works which are generally available for public access will require approval.</li> <li>The modified access and car parking for the Men's shed has <u>not</u> been classified as 'METRONET Works' and therefore has been deliberately included in the station scope of works.</li> <li>Any other works and infrastructure included within the scope of this METRONET project will <u>not</u> require formal approval.</li> </ul>

## 8. Planning Considerations

### 8.1 State Planning Assessment

Table 9 – Summary of State Planning Assessment

Item	Summary
<p>Perth and Peel @ 3.5 million</p> <p>North-East Sub Regional Planning Framework</p>	<p>Perth and Peel @3.5 million and the North-East Sub Regional Planning Framework identify Ellenbrook as a key growth sector for the Perth Metropolitan Area. Ellenbrook is identified as a ‘Secondary Centre’ with significant expansions to retail, residential commercial and institutional provisions anticipated to service the local and surrounding populations.</p> <p>These high-level strategic policies directly identify the MEL alignment with a terminus at Ellenbrook Station. The MEL METRONET initiative is noted as an integral part of service provision within the north east corridor to provide greater connection with the surrounding areas as well as the Perth CBD.</p> <p>Ellenbrook Station is therefore entirely consistent with the overarching strategic framework. The Station will formulate an integral component of the Ellenbrook Secondary Centre and will assist with the service provision for the emerging population of the sub- region.</p>
<p>MRS</p>	<p>Ellenbrook Station will entirely be located within Planning Control Area No. 144 (PCA 144). PCA 144 has been established specifically to facilitate the delivery of Ellenbrook Station.</p> <p>The development of Ellenbrook Station is entirely consistent with the underlying PCA.</p>
<p>State Planning Policy No. 4.2 – Activity Centres for Perth and Peel (SPP4.2)</p>	<p>Ellenbrook is identified under SPP 4.2 as a ‘Secondary Centre’ with the Ellenbrook Station being located within the Secondary Centre area. A Secondary Centre is to provide for a similar level of services as the Metropolitan Centre but with a focus on the immediate and sub-regional populations.</p> <p>Service provision by way of significant infrastructure projects such as Ellenbrook Station is entirely consistent with the desired form and function of a Secondary Centre. Ellenbrook Station will provide a vital connection for the emerging population to the surrounding regions and Perth CBD.</p> <p>Key themes and objectives of SPP4.2 which are directly applicable to this development application are as follows:</p> <ul style="list-style-type: none"> <li>• Accessibility to public transport, and planning in line with transit-oriented development principles.</li> <li>• Encouraging an appropriate land use diversity mix through the provision of essential transport services and connections.</li> <li>• Prioritising mode-shift towards public transport, walking and cycling, and reducing reliance on private cars.</li> </ul> <p>The design principles outlined in preceding sections of this report have demonstrated the various ways in which Ellenbrook Station has met these objectives.</p>

Item	Summary
<p>SPP 5.4 – Road and Rail Noise</p>	<p>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.</p> <p>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 Ellenbrook Station. Importantly, the PTA has also committed to undertaking further operational modelling to ensure the modelled noise outcomes are accurate.</p> <p>Sensitive land uses within 100m of Ellenbrook Station such as future residential development to the immediate north and west may require ‘quiet house’ design standards being applied. Managing the existing and future sensitive land uses around Ellenbrook Station is a key consideration for the PTA in the delivery of Ellenbrook Station.</p>
<p>DCP 1.6 – Planning to Support Transit Use and TOD</p>	<p>The key objective of DCP1.6 is to encourage the co-location of development and transportation. This is intended to serve the mutual benefit of increasing patronage on the public transport system, as well as decreasing reliance on the private vehicle.</p> <p>Ellenbrook Station strongly supports transport orientated development principles, given it provides a multi-modal station within the core of the Ellenbrook Secondary Centre.</p> <p>Whilst the detailed station design is yet to be finalised, ensuring compliance with TOD principles remains an important component of the development.</p> <p>In summary, the following design components of the Ellenbrook Station support TOD principles:</p> <ul style="list-style-type: none"> <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> <li>• The location of the station within the Ellenbrook Secondary Centre and within walking proximity to Ellenbrook Central will allow for synergies between the major bus and rail transport nodes and service provisions within the Secondary Centre.</li> </ul> <p>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.</p>

### 8.1.1 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 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 particularly relevant to the MEL stations given the surrounding centres are in a state of transition, and the ultimate activity centre station design may vary as the supporting activity centre development evolves.

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.

The Preliminary Place Plan & Indicative Layout Response prepared for the Ellenbrook Station has identified the station as a 'Town Centre (SP4)' type station precinct which is intended to grow into a 'Strategic Centre (SP2)' type station precinct into the future. The respective descriptions of these station typologies are as follows:

#### Town Centre

*Town station precincts are hubs for the immediately surrounding suburbs, and provide a range of shops, employment opportunities, community services and facilities to the local and wider area.*

#### City Centre

*Specialist station precincts have a primary role as major public and institutional Centre. These primary uses generate significant levels of activity, employment and demand for transit from a wide range of destinations.*

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

- Critical Element 4: Intersections and Crossings
- 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 critical elements to the proposed Ellenbrook station design.

Table 10 – Station Critical Element

STATION CRITICAL ELEMENT	DETAILS
<b>Critical Element 4: Intersection and Crossings</b>	
<p><i>Preferred: controlled four way intersection, no splitter lanes.</i></p> <p><i>Considered: Micro roundabout</i></p>	<p>All intersections within the PTA car park and busway are sign-controlled intersections with no splitter lanes. The busway roundabouts are designed to the required swept path (noting that this area will accommodate over-sized articulated buses.</p>
<b>Critical Element 5a: Transit Integration - Rail</b>	
<p><i>Preferred:</i></p> <div style="display: flex; flex-direction: column; gap: 10px;"> <div>  <span>Underground Tunnel</span> </div> <div>  <span>Cut and Cover</span> </div> </div> <p><i>Considered:</i></p> <div style="display: flex; flex-direction: column; gap: 10px;"> <div>  <span>Elevated on Viaduct</span> </div> <div>  <span>Open cut</span> </div> </div>	<p>The Ellenbrook Station is designed as an ‘at-grade’ station. Whilst this is not a preferred or considered design for the station typology, it is a suitable station design for Ellenbrook Station as an ‘end of the line’ station, and allows the station to integrate well with the surrounding area. Ellenbrook Station was previously considered as a station in a cutting, however, the high groundwater table in this area made this a very expensive option. Furthermore, there are a number of advantages to an at-grade station in a town centre where it is an end of line station:</p> <ul style="list-style-type: none"> <li>- No requirement for vertical transport;</li> <li>- Ability to provide prominent architecture that creates a civic space;</li> <li>- Limited segregation as road crossings can be provided beyond the station; and</li> <li>- Good integration with the centre and bus interchange.</li> </ul>
<b>Critical Element 5b: Transit Integration – Bus</b>	
<p><i>Preferred: on street.</i></p> <p><i>Integrated/stacked interchange loop at grade</i></p>	<p>The Ellenbrook station provides an at grade bus interchange immediately adjacent to the station building. This is consistent with the preferred approach.</p>
<b>Critical Element 6: Station Type</b>	
<p><i>Preferred: integrated station, underground station.</i></p>	<p>The following design elements demonstrate that the Ellenbrook Station is best classified as an integrated station, consistent with the ‘preferred’ approach for a Town / City Centre station.</p> <p><u>Integrated into the streetscape / form a seamless part of the urban streetscape</u></p> <p>Multiple aspects of the station have been designed to appropriately interface with surrounding future development. This includes the integration of the station building with the adjacent Village Common open space, and opportunities for future development adjoining the station.</p> <p><u>Avoid the creation of movement barriers</u></p>

STATION CRITICAL ELEMENT	DETAILS
	<p>The Ellenbrook Station is an end of line station, with no barriers to integrating the station building with ‘The Parkway’ streetscape and wider area.</p> <p><u>Streetscape to be dedicated for entry ways to the station</u></p> <p>The entrance experience for the Ellenbrook Station is enhanced by the use of a high quality station forecourt and adjacent ‘Village Common’ open space area. Combined, these areas create clear wayfinding cues to the station entrance, as well as creating a pleasant entrance experience.</p>
<p><b>Critical Element 7a: Station Dedicated Parking</b></p>	
<p><i>Preferred (Core): no park’n’ride</i></p> <p><i>Considered (Core): limited park’n’ride (stacked/decked)</i></p>	<p>The Ellenbrook Station provides at grade parking for passengers. This is <u>not</u> recognised as either a preferred or considered form of parking for a town centre / city centre station precinct type.</p> <p>Providing some degree of parking is a requirement of the SWTC, and is therefore politically a necessary component of delivering the train station.</p> <p>The focus is therefore delivering this parking with the least impact on station amenity, whilst also reducing the barrier to the potential redevelopment and re-use of the car parking areas. As at-grade parking requires the least structural investment, this form of parking is more conducive to urban redevelopment, as compared to stacked or decked parking.</p> <p>Ellenbrook line is an end of line station servicing rural areas beyond the immediate urban catchment. It is therefore not possible to adequately service the catchment area by alternative modes. Due to the availability of land immediately within the vicinity of the station and location of Ellenbrook on the Urban fringe, stacked/decked parking is not considered an appropriate option though could be provided in the longer term.</p> <p>Further to the above, stacked/decked parking should be considered only when it is viable to construct it as part of transit oriented development adjacent to the station. Otherwise the scale of the parking would detract from the amenity of the station and surrounds.</p> <p>In terms of integration with the surrounding areas, the car parking layout is deliberately broken up into two separate parking areas, and distributed to reduce the concentration of carparking. The parking areas are also deliberately placed behind a future development lot, sleeving the parking from view of The Parkway.</p>

### Critical Element 8: Public Realm and Public Open Space

*Preferred: people streets  
plaza/square, playspace urban  
park*

The Ellenbrook Station provides a station forecourt area with deliberately placed planters to define the pedestrian routes. This area has been designed to blend with the adjacent 'Village Common' open space area. By combining these areas, the spaces benefit from an increased scale and prominence, making them a more functional park space, as well as increasing the opportunities for mutual passive surveillance.

#### 8.1.2 Planning Control Area No. 144 (PCA 144)

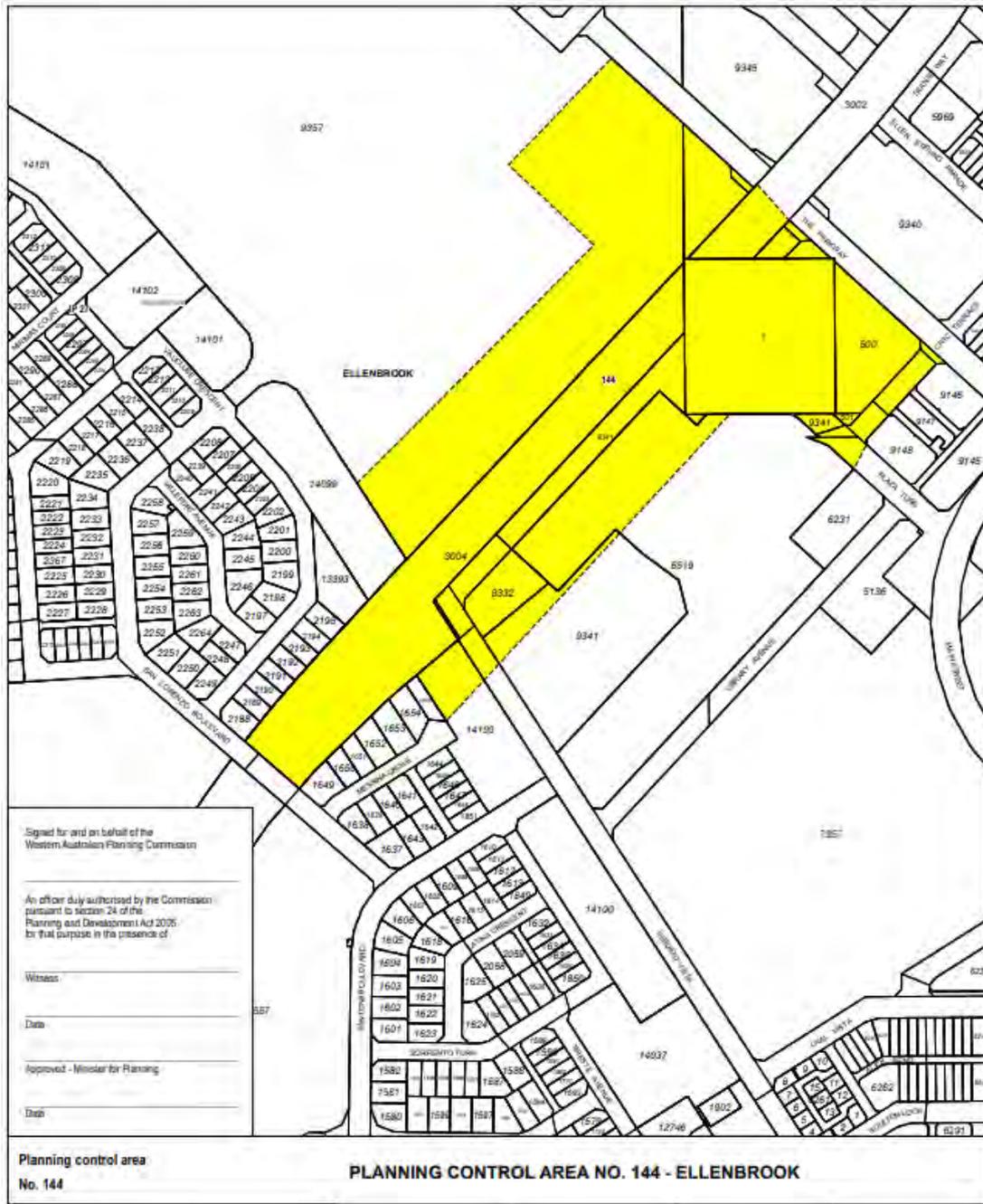
The proposed Ellenbrook Train Station works are wholly located within PCA144, which has been established for the purpose of facilitating the development of the land for the purpose of railways and related public purposes.

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 City of Swan. 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 Commission must then make a decision within 60 days of receiving the forwarded application (Section 250(3) of the PD Act).

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 6 - PCA 144



### 8.1.3 Improvement Plan No. 27 – Ellenbrook

The role of an improvement plan is to function as a strategic instrument, designed to facilitate the development of identified areas, but the improvement plans themselves do not have any statutory effect. Improvement Plan No. 27 was first certified in March 1995, and was intended to advance the planning, development and use of the Ellenbrook area.

Due to its age, Improvement Plan No. 27 is no longer considered to be a relevant instrument in the assessment of this development application.

## 8.2 Local Planning Framework

As noted earlier in this report, the proposed development meets the categorisation of 'Public Works' and is exempt under Section 6 of the *Planning and Development Act 2005*. Regardless, as the interface between the Ellenbrook Station and surrounding Ellenbrook Secondary Centre is an essential consideration in the successful station planning design, and the driving principles and objectives of the have been considered for this application.

In this respect, the Ellenbrook Town Centre Development Plan is indirectly applicable to the development approval process for the Ellenbrook Station. The following sections provide a contextual summary of the Ellenbrook Town Centre Development Plan, as it applies to the proposed development.

### 8.2.1 Ellenbrook Town Centre Development Plan

The Ellenbrook Town Centre Development Plan was first approved in February 2005, predating the Planning and Development (Local Planning Schemes) Regulations 2015), and been amended on a number of occasions the most recent being in May 2021. The document provides the design framework for the progressive development of the Ellenbrook Town Centre, as outlined through specific statutory implementation requirements, and a series of design guidelines.

As outlined in Figure 7 below, the Ellenbrook Station will be predominately located within the designated 'Transit Corridor', which aligns with the 'Special Use' reservation under the MRS. This corridor is intersected by the north south Neighbourhood Connector (being The Parkway). Adjoining land is identified as being within the 'High Street Station' precinct, with the intent being to link the northern and southern portions of the Town Centre with uses ranging from high density living to commercial and retail, all drawing amenity from a central park.

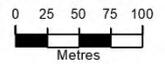
Supporting components of the Ellenbrook Station will also be located within the designated 'Recreation' zone, which includes the proposed southern station carpark. The recreation grounds have since been established as the Charlie Gregorini Memorial Park, with the land accommodating the car park currently being vacant and surplus to the recreation needs.

The Ellenbrook Station is recognised to be a key element in delivering this higher density, with The Parkway being the key main street spine connecting these spaces together. Given the Ellenbrook Station design places focus on addressing The Parkway and providing high amenity connections, the design is entirely consistent with the intent of this development plan.

Figure 7 - Ellenbrook Town Centre Development Plan



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**DEVELOPMENT PLAN**

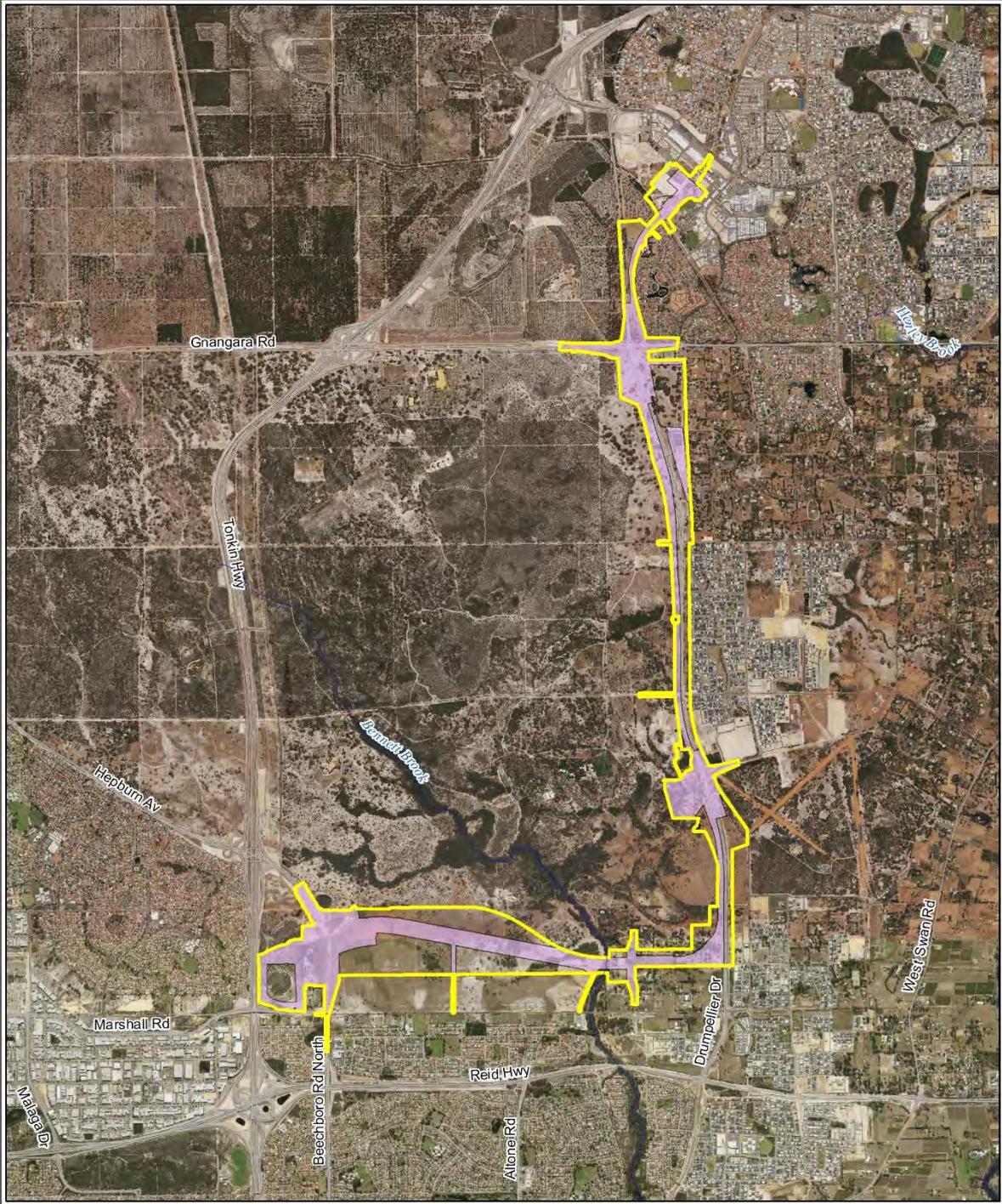
## 9. Supporting Approvals and Management Plans

The following table provides a summary of those approvals.

Table 11 – Summary of Supporting Approvals and Management Measures

CONSIDERATION	DETAIL
<p><b>Environmental Approvals</b></p>	<p>The Malaga to Ellenbrook Line clearing works were granted approval by the EPA in December 2020 (Ministerial Statement No. 1156). This approval included the clearing required to:</p> <p><i>Construct and operate a new 13 kilometer railway line between Malaga and Ellenbrook in the City of Swan. The proposal includes the construction of new train stations and associated facilities at Malaga, Whiteman Park and Ellenbrook, and a potential future station at Bennett Springs.</i></p> <p>Approval was granted for the clearing and disturbance if no more than 249ha (of which 152.1ha is native vegetation) for the alignment. <b>Figure 8</b> below outlines the approved disturbance footprint for this alignment.</p> <p>This clearing approval was subject to a number of notable conditions, including the requirement to establish offsets and management plans to mitigate the environmental impacts of clearing.</p> <p>The Ministerial Statement No. 1156 is provided at <b>Appendix G</b> of this report, and outlines these measures in detail</p>
<p><b>Noise Monitoring Program</b></p>	<p>A noise monitoring program will be implemented within three months of the opening of the MEL line, and again at 18 months, to assess the effectiveness of noise mitigation. Specifically the program will:</p> <ul style="list-style-type: none"> <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> <li>• Assess the accuracy of the pre-construction noise modelling predictions that were used to determine noise reduction treatments.</li> </ul> <p>The PTA also has existing procedures for receiving noise complaints, which will be extended to the MEL operations.</p>
<p><b>Out of Hours Work</b></p>	<p>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.</p> <p>An Out of Hours Construction Noise and Vibration Management Plan will be provided to the City of Swan 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 Noise Regulations.</p> <p>For the purpose of the planning approval process, we request that any condition of approval related to construction hours is worded in a manner that does not restrict these out of hours works (subject to acceptance of the Construction Noise and Vibration Management Plan).</p>

CONSIDERATION	DETAIL
<b>Construction Management</b>	A construction management plan will be delivered by the PTA / MELConnx prior to works commencing on site, which is expected to be reflected through a condition of development approval.
<b>Dilapidation survey</b>	A dilapidation survey, prior to demolition and excavation works commencing on site, will be commissioned 100m beyond the works area to document existing conditions of adjoining properties and infrastructure. A re-inspection post project completion will also be commissioned to assess conditions against those reported before works commenced.
<b>Access and approvals</b>	The Project Alliance will obtain permission for site access to all work areas from the relevant stakeholders prior to commencing construction works. All environmental, LGA and rail authority approvals shall be gained prior to construction works commencing onsite.
<b>Traffic Management Plan</b>	<p>The Project Traffic Management Plan will ensure:</p> <ul style="list-style-type: none"> <li>• Existing paths are maintained or alternative sealed pathways are provided of a 2.0m minimum width.</li> <li>• Temporary paths where required will have secure fencing and appropriate lighting</li> <li>• Height clearances for roads is not reduced to less than 5.3m where possible. Approval to be sort should this not be possible</li> <li>• Ensure security to adjacent properties</li> <li>• Construction personnel will be encouraged to use public transport where possible</li> </ul> <p>Construction personnel’s vehicles or construction vehicles are to park only in designated parking bays within the construction site and not use public or Transperth parking bays.</p> <p>It is expected that the delivery of a traffic management plan will be a condition of development approval.</p>
<b>Subdivision Approval</b>	<p>As noted within Table 6 of this report, Cussington Way will ultimately be created as a public road through a subdivision approval. The scope of this development application will include the physical construction of the road, but the subdivision to legally create the road will be coordinated by a third party.</p> <p>At the time of writing this report, the lodgement of this supporting subdivision application was imminent. Importantly, the intent is to have this land dedicated as a public road prior to operation of the Ellenbrook Station.</p>



<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li><span style="border: 2px solid yellow; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Development Envelope</li> <li><span style="background-color: purple; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></span> Disturbance Footprint</li> <li><span style="border-bottom: 1px solid blue; display: inline-block; width: 20px; margin-right: 5px;"></span> Rivers DWER</li> <li><span style="border-bottom: 1px solid grey; display: inline-block; width: 20px; margin-right: 5px;"></span> Roads</li> </ul>	<p><b>SOURCE DATA</b>          Proponent: Public Transport Authority          Basemap: ESRI World Imagery</p> <p>DWER GIS Section          Date: 25/09/2020, Map Version: 1          File No: DWERT239330</p> <p><small>Disclaimer:          This map is intended as a generalised interpretation of environmental issues. The information contained in this map is to be considered indicative only and in no event shall the Department of Water and Environmental Regulation be liable for any incident or consequential damage resulting from use of the map.</small></p> <p><small>Copyright Department of Water and Environmental Regulation, 2020.          All Rights Reserved. All works and information depicted are subject to Copyright. For the reproduction or publication beyond that permitted by the Commonwealth Copyright Act 1968 written permission must be sought from the Agency.</small></p>	 <p style="text-align: center;">N  </p> <p style="text-align: center;">0   0.5   1   2          Kilometres</p> <p style="text-align: center;">Projection: Map Grid of Australia Zone 50          Datum: Geocentric Datum of Australia, 1994          Scale: 1:50,000 at A4</p>	<p><b>LOCALITY MAP</b></p>  <p style="text-align: center;">PERTH</p>
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## 10. Conclusion

The METRONET Morley Ellenbrook Link from Bayswater to Ellenbrook set out to implement best practice urban design and transport planning principles to the emerging north east corridor of Perth. The Ellenbrook Station is an exceptional example of this approach, which by placing the Ellenbrook multi-modal station within the planned Ellenbrook Secondary Centre creates the foundations for successfully achieving transport orientated development, and embedding opportunities for urban development without creating sole reliance on the private vehicle.

But the successful application of transport orientated development extends beyond simply placing a train station within an activity centre. Instead, a well thought out station design also requires careful consideration of desire lines, convenience and opportunities for engagement with the activity centre. This report concludes that the Ellenbrook Station achieves these essential pillars of a contemporary station, as evidenced through the following:

- A pedestrian first approach to the station building design, which creates logical and direct links to the local connector roads and open spaces. As the station is an 'end-of-line' station, the development also takes this opportunity to provide an 'at-grade' station building, with no perceivable barriers to the public realm connections.
- The co-location of the bus interchange and station building reduces the total journey time for multi-modal trips, making bus-to-train transport a more practical and feasible option for patrons. The sheltered links also improve the quality of this connection.
- Providing essential pedestrian connecting infrastructure, including an extension of the existing shared path network to the Ellenbrook Station.
- Recognising the need for park-and-ride facilities for a train station in an emerging urban centre, facilities have been located adjacent to the station. 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.
- Development of the Village Common is proposed to create an attractive and usable space within the immediate vicinity of the station, and provides a connection to the shared path network along the transit corridor.

Whilst the development application is for 'public works' and has limited statutory assessment controls under the local government framework, this has in no way resulted in a compromised design outcome for the Ellenbrook 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 Ellenbrook Station is designed to be fit for purpose, and will be the catalyst for further supporting high quality development within Ellenbrook.

## Disclaimer

This report is dated 8 June 2021 and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd (**Urbis**) opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of MELConnx / Public Transport Authority (**Instructing Party**) for the purpose of Development Application (**Purpose**) and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

In preparing this report, Urbis was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment.

All surveys, forecasts, projections and recommendations contained in or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report, and upon which Urbis relied. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

In preparing this report, Urbis may rely on or refer to documents in a language other than English, which Urbis may arrange to be translated. Urbis is not responsible for the accuracy or completeness of such translations and disclaims any liability for any statement or opinion made in this report being inaccurate or incomplete arising from such translations.

Whilst Urbis has made all reasonable inquiries it believes necessary in preparing this report, it is not responsible for determining the completeness or accuracy of information provided to it. Urbis (including its officers and personnel) is not liable for any errors or omissions, including in information provided by the Instructing Party or another person or upon which Urbis relies, provided that such errors or omissions are not made by Urbis recklessly or in bad faith.

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 - Certificates of Title and Management Orders

WESTERN



AUSTRALIA

REGISTER NUMBER <b>9370/DP420153</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **4003** FOLIO **804**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 9370 ON DEPOSITED PLAN 420153

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

HOUSING AUTHORITY OF CARE OF ELLENBROOK MANAGEMENT PTY LTD LEVEL 2 1060 HAY STREET WEST  
PERTH WA 6005  
(AF 0721657 ) REGISTERED 31/5/2021

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. \*E450634 EASEMENT FOR PIPELINE PURPOSES PURSUANT TO SECTION 19(4) OF THE PETROLEUM PIPELINES ACT 1969 - SEE DEPOSITED PLAN 420153 RECORDED 15/11/1971.  
\*E436144 NOTIFICATION OF TRANSFER OF EASEMENT E450634 PURSUANT TO SECTION 20(5) OF THE PETROLEUM PIPELINES ACT 1969. GRANTEES ARE NOW SHELL DEVELOPMENT (AUSTRALIA) PTY LTD, AUSTRALASIAN OIL EXPLORATION LTD, TEXACO OIL DEVELOPMENT COMPANY AND CHEVRON ASIATIC LTD. RECORDED 30/8/1990.
2. \*G641038 EASEMENT TO GAS CORPORATION FOR GAS PIPELINE PURPOSES - SEE DEPOSITED PLAN 420153 REGISTERED 20/11/1997.  
\*H609998 SUNDRY. THE GRANTEE OF TRANSFER G641038 IS NOW THE DBNGP LAND ACCESS MINISTER PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. REGISTERED 30/11/2000.
3. \*H609998 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 420153 REGISTERED 30/11/2000.
4. \*H422967 CAVEAT BY BANK OF WESTERN AUSTRALIA LODGED 18/4/2000.
5. \*I543635 CAVEAT BY BANK OF WESTERN AUSTRALIA LODGED 9/7/2003.
6. \*K210203 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 420153 REGISTERED 30/5/2007.
7. \*K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION OF THE WITHIN LAND SHOWN ON DEPOSITED PLAN 420153 REGISTERED 30/5/2007.
8. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR ELECTRICITY PURPOSES TO

END OF PAGE 1 - CONTINUED OVER

Subject to dealing

RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: 9370/DP420153

VOLUME/FOLIO: 4003-804

PAGE 2

ELECTRICITY NETWORKS CORPORATION - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 409067

9. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 411236
10. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR ELECTRICITY PURPOSES TO ELECTRICITY NETWORKS CORPORATION - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 412571
11. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR TELECOMMUNICATION PURPOSES TO NBN CO LTD - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 412571
12. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR DRAINAGE PURPOSES TO CITY OF SWAN - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 415095
13. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION - SEE DEPOSITED PLAN 420153 AS CREATED ON DEPOSITED PLAN 60838

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 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:	DP420153
PREVIOUS TITLE:	4001-478
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF SWAN
RESPONSIBLE AGENCY:	DEPARTMENT OF COMMUNITIES (SSHC)

NOTE 1:	DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M348709
NOTE 2:	O781909 DEPOSITED PLAN 421590 LODGED

Subject to dealing

WESTERN



AUSTRALIA

REGISTER NUMBER <b>1/D64679</b>	
DUPLICATE EDITION <b>4</b>	DATE DUPLICATE ISSUED <b>9/3/2018</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **1647** FOLIO **704**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 1 ON DIAGRAM 64679

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 140 WILLIAM STREET PERTH WA 6000  
(T N846915 ) REGISTERED 8/3/2018

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. H573934 SUNDRY - THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997 AND IS ALSO SUBJECT TO STATE CORRIDOR RIGHTS AS DEFINED IN SECTION 28 OF THE SAID ACT. REGISTERED 13/10/2000.

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 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: 1647-704 (1/D64679)  
PREVIOUS TITLE: 1271-712  
PROPERTY STREET ADDRESS: LOT 1 PLAZA TURN, ELLENBROOK.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: WESTERN AUSTRALIAN PLANNING COMMISSION

WESTERN



AUSTRALIA

REGISTER NUMBER <b>8332/DP400254</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2834** FOLIO **464**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 8332 ON DEPOSITED PLAN 400254

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

CITY OF SWAN OF 2 MIDLAND SQUARE, MIDLAND

(T M554968 ) REGISTERED 19/2/2014

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. \*I687182 RESTRICTIVE COVENANT BURDEN. SEE SKETCH DEPOSITED PLAN 400254 REGISTERED 7/11/2003.
2. \*K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION OF THE WITHIN LAND SHOWN ON DEPOSITED PLAN 50954 & 50956 ONLY. REGISTERED 30/5/2007.
3. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION SEE DEPOSITED PLAN 400254
4. \*M554965 NOTIFICATION SECTION 165 PLANNING & DEVELOPMENT ACT 2005 LODGED 19/2/2014.

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 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: DP400254  
PREVIOUS TITLE: 2815-96  
PROPERTY STREET ADDRESS: 4 TRANSIT WAY, ELLENBROOK.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M554966

WESTERN



AUSTRALIA

REGISTER NUMBER <b>8660/DP400254</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2834** FOLIO **465**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 8660 ON DEPOSITED PLAN 400254

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

STATE OF WESTERN AUSTRALIA

(T M554967 ) REGISTERED 19/2/2014

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

- \*K210203 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 400254. REGISTERED 30/5/2007.
- \*K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION OF THE WITHIN LAND SHOWN ON DEPOSITED PLAN 50954 & 50956 ONLY. REGISTERED 30/5/2007.

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 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: DP400254  
PREVIOUS TITLE: 2815-96  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M554966

WESTERN



AUSTRALIA

REGISTER NUMBER <b>500/DP415089</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
**UNDER THE TRANSFER OF LAND ACT 1893**

VOLUME **2963** FOLIO **862**

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.

*BGRoberts*  
 REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 500 ON DEPOSITED PLAN 415089

**REGISTERED PROPRIETOR:**  
 (FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 140 WILLIAM STREET PERTH WA 6000  
 (T 0094865 ) REGISTERED 1/4/2019

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
 (SECOND SCHEDULE)

- 1. \*I687182 RESTRICTIVE COVENANT BURDEN. SEE DEPOSITED PLAN 415089. REGISTERED 7/11/2003.

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 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: DP415089  
 PREVIOUS TITLE: 2913-296  
 PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
 LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
 RESPONSIBLE AGENCY: WESTERN AUSTRALIAN PLANNING COMMISSION

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M348709

WESTERN



AUSTRALIA

REGISTER NUMBER <b>501/DP415089</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2963** FOLIO **863**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 501 ON DEPOSITED PLAN 415089

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 140 WILLIAM STREET PERTH WA 6000  
(T O094865 ) REGISTERED 1/4/2019

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

- \*H609998 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 415089. REGISTERED 30/11/2000.
- \*I687182 RESTRICTIVE COVENANT BURDEN. SEE DEPOSITED PLAN 415089. REGISTERED 7/11/2003.

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 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: DP415089  
PREVIOUS TITLE: 2913-297  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: WESTERN AUSTRALIAN PLANNING COMMISSION

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M554966

WESTERN



AUSTRALIA

REGISTER NUMBER <b>9345/DP415969</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
 UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2967** FOLIO **405**

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.

*BGRoberts*  
 REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 9345 ON DEPOSITED PLAN 415969

**REGISTERED PROPRIETOR:**  
 (FIRST SCHEDULE)

HOUSING AUTHORITY OF CARE OF ELLENBROOK MANAGEMENT PTY LTD 34 MAIN STREET ELLENBROOK WA 6069  
 (AF O149406 ) REGISTERED 29/5/2019

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
 (SECOND SCHEDULE)

- \*I543635 CAVEAT BY BANK OF WESTERN AUSTRALIA LTD LODGED 9/7/2003.
- \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION - SEE DEPOSITED PLAN 415969 AS CREATED ON DEPOSITED PLAN 76531.

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 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: DP415969  
 PREVIOUS TITLE: 2913-317  
 PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
 LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
 RESPONSIBLE AGENCY: DEPARTMENT OF COMMUNITIES (SSHC)

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING M348709

WESTERN



AUSTRALIA

REGISTER NUMBER <b>9341/DP415100</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2967** FOLIO **545**

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.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 9341 ON DEPOSITED PLAN 415100

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

HOUSING AUTHORITY OF CARE OF ELLENBROOK MANAGEMENT PTY LTD 34 MAIN STREET ELLENBROOK WA 6069  
(AF O155436 ) REGISTERED 29/5/2019

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. \*H422967 CAVEAT BY BANK OF WESTERN AUSTRALIA LTD AS TO THE PORTION FORMERLY COMPRISED IN VOLUME 2777 FOLIO 791. LODGED 18/4/2000.
2. \*H609998 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 415100 REGISTERED 30/11/2000.
3. \*I543635 CAVEAT BY BANK OF WESTERN AUSTRALIA LTD LODGED 9/7/2003.
4. \*K210203 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 415100 REGISTERED 30/5/2007.
5. \*K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997 - AS TO PORTION ONLY. SEE SKETCH ON DEPOSITED PLAN 50954. REGISTERED 30/5/2007.
6. \*EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION - SEE DEPOSITED PLAN 415100 AS CREATED ON DEPOSITED PLAN 400254.

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 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.

END OF PAGE 1 - CONTINUED OVER

RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: 9341/DP415100

VOLUME/FOLIO: 2967-545

PAGE 2

SKETCH OF LAND:

DP415100

PREVIOUS TITLE:

2963-865

PROPERTY STREET ADDRESS:

NO STREET ADDRESS INFORMATION AVAILABLE.

LOCAL GOVERNMENT AUTHORITY:

CITY OF SWAN

RESPONSIBLE AGENCY:

DEPARTMENT OF COMMUNITIES (SSHC)

NOTE 1:

DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING  
M554966

WESTERN



AUSTRALIA

REGISTER NUMBER <b>3002/DP44081</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

VOLUME **LR3110** FOLIO **624**

**RECORD OF CERTIFICATE  
OF  
CROWN LAND TITLE  
UNDER THE TRANSFER OF LAND ACT 1893  
AND THE LAND ADMINISTRATION ACT 1997  
NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 3002 ON DEPOSITED PLAN 44081

**STATUS ORDER AND PRIMARY INTEREST HOLDER:  
(FIRST SCHEDULE)**

**STATUS ORDER/INTEREST:** RESERVE WITHOUT MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** STATE OF WESTERN AUSTRALIA

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:  
(SECOND SCHEDULE)**

1. I687182 RESTRICTIVE COVENANT BURDEN. REGISTERED 7/11/2003.
2. M185877 RESERVE 48241 FOR THE PURPOSE OF TRANSIT CORRIDOR REGISTERED 14/2/2013.

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

-----END OF CERTIFICATE OF CROWN LAND 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: DP44081  
PREVIOUS TITLE: 2229-748, 2538-641  
PROPERTY STREET ADDRESS: LOT 3002 ARBOR DR, ELLENBROOK.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: M340275 DEPOSITED PLAN 77077 LODGED.

WESTERN



AUSTRALIA

REGISTER NUMBER <b>15393/DP38341</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

VOLUME **LR3133** FOLIO **377**

**RECORD OF CERTIFICATE  
OF  
CROWN LAND TITLE  
UNDER THE TRANSFER OF LAND ACT 1893  
AND THE LAND ADMINISTRATION ACT 1997  
NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 15393 ON DEPOSITED PLAN 38341

**STATUS ORDER AND PRIMARY INTEREST HOLDER:  
(FIRST SCHEDULE)**

**STATUS ORDER/INTEREST:** ROAD

**PRIMARY INTEREST HOLDER:** STATE OF WESTERN AUSTRALIA

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:  
(SECOND SCHEDULE)**

1. DEDICATED ROAD
2. J086683 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 38427. REGISTERED 16/11/2004.

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

-----END OF CERTIFICATE OF CROWN LAND 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: LR3133-377 (15393/DP38341)  
PREVIOUS TITLE: LR3133-377  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: DEPARTMENT OF PLANNING, LANDS AND HERITAGE (ROAD)

NOTE 1: A000001A CORRESPONDENCE FILE 01310-2002-01RO.

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE

REGISTER NUMBER: 15393/DP38341

VOLUME/FOLIO: LR3133-377

PAGE 2

NOTE 2: LAND PARCEL IDENTIFIER OF SWAN LOCATION 15393 ON SUPERSEDED PAPER CERTIFICATE OF CROWN LAND TITLE CHANGED TO LOT 15393 ON DEPOSITED PLAN 38341 ON 10-MAY-04 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 3: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE.

WESTERN



AUSTRALIA

REGISTER NUMBER <b>300/DP50955</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

VOLUME **LR3142** FOLIO **766**

**RECORD OF CERTIFICATE  
OF  
CROWN LAND TITLE  
UNDER THE TRANSFER OF LAND ACT 1893  
AND THE LAND ADMINISTRATION ACT 1997  
NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 300 ON DEPOSITED PLAN 50955

**STATUS ORDER AND PRIMARY INTEREST HOLDER:  
(FIRST SCHEDULE)**

**STATUS ORDER/INTEREST:** ROAD

**PRIMARY INTEREST HOLDER:** STATE OF WESTERN AUSTRALIA

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:  
(SECOND SCHEDULE)**

1. DEDICATED ROAD
2. K210203 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 50955 REGISTERED 30/5/2007.
3. K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION OF THE WITHIN LAND SHOWN ON DEPOSITED PLAN 50955 ONLY. REGISTERED 30/5/2007.

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

-----END OF CERTIFICATE OF CROWN LAND 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: DP50955  
PREVIOUS TITLE: LR3142-766  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE

REGISTER NUMBER: 300/DP50955

VOLUME/FOLIO: LR3142-766

PAGE 2

RESPONSIBLE AGENCY:

DEPARTMENT OF PLANNING, LANDS AND HERITAGE (ROAD)

WESTERN



AUSTRALIA

REGISTER NUMBER <b>3004/DP45459</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

RECORD OF CERTIFICATE  
OF  
CROWN LAND TITLE  
UNDER THE TRANSFER OF LAND ACT 1893  
AND THE LAND ADMINISTRATION ACT 1997  
**NO DUPLICATE CREATED**

VOLUME FOLIO  
**LR3163 162**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 3004 ON DEPOSITED PLAN 45459

**STATUS ORDER AND PRIMARY INTEREST HOLDER:**  
(FIRST SCHEDULE)

**STATUS ORDER/INTEREST:** RESERVE WITHOUT MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** STATE OF WESTERN AUSTRALIA

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. G641038 EASEMENT TO GAS CORPORATION FOR GAS PIPELINE PURPOSES. SEE SKETCH ON DEPOSITED PLAN 45459. REGISTERED 20/11/1997.  
H609998 SUNDRY. THE GRANTEE OF TRANSFER G641038 IS NOW THE DBNGP LAND ACCESS MINISTER PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. REGISTERED 30/11/2000.
2. EASEMENT BURDEN - SEE DEPOSITED PLAN 71808 AND INSTRUMENT G641039  
H609998 THE GRANTEE OF THE ABOVE EASEMENT IS NOW THE DBNGP LAND ACCESS MINISTER PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. REGISTERED 30/11/2000.
3. H609998 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 45459. REGISTERED 30/11/2000.
4. H647248 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE LAND ADMINISTRATION PLAN 15564 & DEPOSITED PLAN 45459. REGISTERED 17/1/2001.
5. K210203 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 45459. REGISTERED 30/5/2007.
6. K210204 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER THE PROVISIONS OF

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE

REGISTER NUMBER: 3004/DP45459

VOLUME/FOLIO: LR3163-162

PAGE 2

7. M185877 THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION OF THE WITHIN  
LAND SHOWN ON DEPOSITED PLAN 50954 & 50956 ONLY. REGISTERED 30/5/2007.  
RESERVE 48241 FOR THE PURPOSE OF TRANSIT CORRIDOR REGISTERED 14/2/2013.

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

-----END OF CERTIFICATE OF CROWN LAND 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: DP45459  
PREVIOUS TITLE: 2150-598, 2777-791, LR3005-89, LR3111-433  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: M185875 CORRESPONDENCE FILE 50128-2007-01RO

WESTERN



AUSTRALIA

REGISTER NUMBER <b>5519/DP406075</b>	
DUPLICATE EDITION <b>N/A</b>	DATE DUPLICATE ISSUED <b>N/A</b>

VOLUME **LR3167** FOLIO **176**

**RECORD OF CERTIFICATE  
OF  
CROWN LAND TITLE  
UNDER THE TRANSFER OF LAND ACT 1893  
AND THE LAND ADMINISTRATION ACT 1997  
NO DUPLICATE CREATED**

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 5519 ON DEPOSITED PLAN 406075

**STATUS ORDER AND PRIMARY INTEREST HOLDER:  
(FIRST SCHEDULE)**

**STATUS ORDER/INTEREST:** RESERVE UNDER MANAGEMENT ORDER

**PRIMARY INTEREST HOLDER:** CITY OF SWAN OF PO BOX 196 MIDLAND WA 6936  
(XE N470916 ) REGISTERED 31/10/2016

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:  
(SECOND SCHEDULE)**

1. H609998 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 406075. REGISTERED 30/11/2000.
2. K300217 EASEMENT TO CITY OF SWAN FOR PUBLIC ACCESS PURPOSES - SEE SKETCH ON DEPOSITED PLAN 406075. REGISTERED 9/8/2007.
3. EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION SEE DEPOSITED PLAN 406075 AS CREATED ON DEPOSITED PLAN 400254.
4. EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR ELECTRICITY PURPOSES TO ELECTRICITY NETWORKS CORPORATION - SEE DEPOSITED PLAN 406075 AS CREATED ON DEPOSITED PLAN 401038.
5. N470915 RESERVE 52644 FOR THE PURPOSE OF PUBLIC RECREATION REGISTERED 31/10/2016.  
N470916 MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED. REGISTERED 31/10/2016.

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

-----END OF CERTIFICATE OF CROWN LAND 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

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE

REGISTER NUMBER: 5519/DP406075

VOLUME/FOLIO: LR3167-176

PAGE 2

and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP406075  
PREVIOUS TITLE: 2842-700  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: CITY OF SWAN  
RESPONSIBLE AGENCY: DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: N470915 CORRESPONDENCE FILE 00598-2016-01RO

## Reserve Details Report -48241

<b>Reserve</b>	48241	<b>Legal Area (ha)</b>	17.977
<b>Name</b>	N/A	<b>Status</b>	CURRENT
<b>Type</b>	N/A	<b>Current Purpose</b>	TRANSIT CORRIDOR
<b>File Number</b>	N/A		
<b>Notes</b>	N/A		
<b>Additional Reserve Information</b>	RESERVE COMPRISES LOT 3002 ON DP44081 AND LOTS 3003 & 3004 ON DP45459 (M185877)		

<b>Class</b>	<b>Responsible Agency</b>	<b>Date of Last Change</b>
C	DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)	25/02/2013

<b>Management Order</b>	<b>Document Number</b>
N/A	N/A

<b>Land Use</b>
ROAD

<b>Local Government Authority</b>
CITY OF SWAN

CLT Number	Parcel Identifier	Street Address, Suburb	File Number	PIN	Area (m <sup>2</sup> )
LR3110/624	Lot 3002 On Deposited Plan 44081	Lot 3002 Arbor Drive, ELLENBROOK 6069	N/A	11423754,11423755,11431687	98158
LR3163/161	Lot 3003 On Deposited Plan 45459	No Street Address Information Available	50128-2007-01RO	11971606	55572
LR3163/162	Lot 3004 On Deposited Plan 45459	No Street Address Information Available	50128-2007-01RO	11971607	26041

<b>Previous Certificates of Title</b>	<b>Status</b>
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Document Number/Gazette Page	Date	Type	Text
M185877	14/02/2013	Current Area	17.9770
J391443	19/08/2005	Class	C

Document Number/Gazette Page	Date	Type	Text
J391443	19/08/2005	Current Purpose	TRANSIT CORRIDOR
J391443	19/08/2005	Historical Area	9.8157

date: Jul 7, 2021, 10:35:54 AM

## Reserve Details Report -52644

<b>Reserve</b>	52644	<b>Legal Area (ha)</b>	4.1938
<b>Name</b>	N/A	<b>Status</b>	CURRENT
<b>Type</b>	N/A	<b>Current Purpose</b>	PUBLIC RECREATION
<b>File Number</b>	N/A		
<b>Notes</b>	N/A		
<b>Additional Reserve Information</b>	RESERVE COMPRISES LOT 5519 ON DP406075 (N470915)		

<b>Class</b>	<b>Responsible Agency</b>	<b>Date of Last Change</b>
C	DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)	19/12/2016

<b>Management Order</b>	<b>Document Number</b>
CITY OF SWAN	N470916

<b>Land Use</b>
PUBLIC RECREATION

<b>Local Government Authority</b>
CITY OF SWAN

CLT Number	Parcel Identifier	Street Address, Suburb	File Number	PIN	Area (m <sup>2</sup> )
LR3167/176	Lot 5519 On Deposited Plan 406075	No Street Address Information Available	00598-2016-01RO	12199944	41938

<b>Previous Certificates of Title</b>	<b>Status</b>
---------------------------------------	---------------

Document Number/Gazette Page	Date	Type	Text
N470915	31/10/2016	Current Area	4.1938
N470915	31/10/2016	Class	C
N470915	31/10/2016	Current Purpose	PUBLIC RECREATION
N470915	31/10/2016	Land Use	7610
N470915	31/10/2016	Responsible Agency	DEPARTMENT OF LANDS (SLSD)
N470916	31/10/2016	Current Vesting	MANAGEMENT ORDER CITY OF SWAN

date: Jul 7, 2021, 10:37:31 AM

## Appendix B - Development Plans

# MORLEY ELLENBROOK LINE (MEL) ELLENBROOK STATION ARCHITECTURE



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

## REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE: 0 10 20 30 40 50 100mm  
A1 AT ORIGINAL PLOT SIZE

This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.



REFERENCES	SCALE	DESIGNED
	(@ A1)	L. BOUDOU
		DRAWN: T. ALLAN
		CHECKED: C. TESTA
		APPROVED: M. ARAVIND
		DATE: 07/06/21

MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE
COVER PAGE
SHEET 1
PTA Drawing No: 25-A-291-AR0001 Rev: A



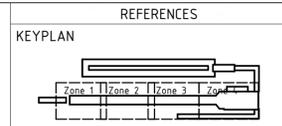


PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REFERENCE DESIGN

A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	
REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
ORIG SIZE	0 10 20 30 40 50 100mm					
A1	AT ORIGINAL PLOT SIZE					

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REFERENCES

SCALE 1 : 2000 (@ A1)

DATUM

HORIZONTAL: PCG2020

VERTICAL: AHD71

DESIGNED L.BOUDOU

DRAWN T.ALLAN

CHECKED C.TESTA

APPROVED M.ARAVIND

DATE 07/06/21

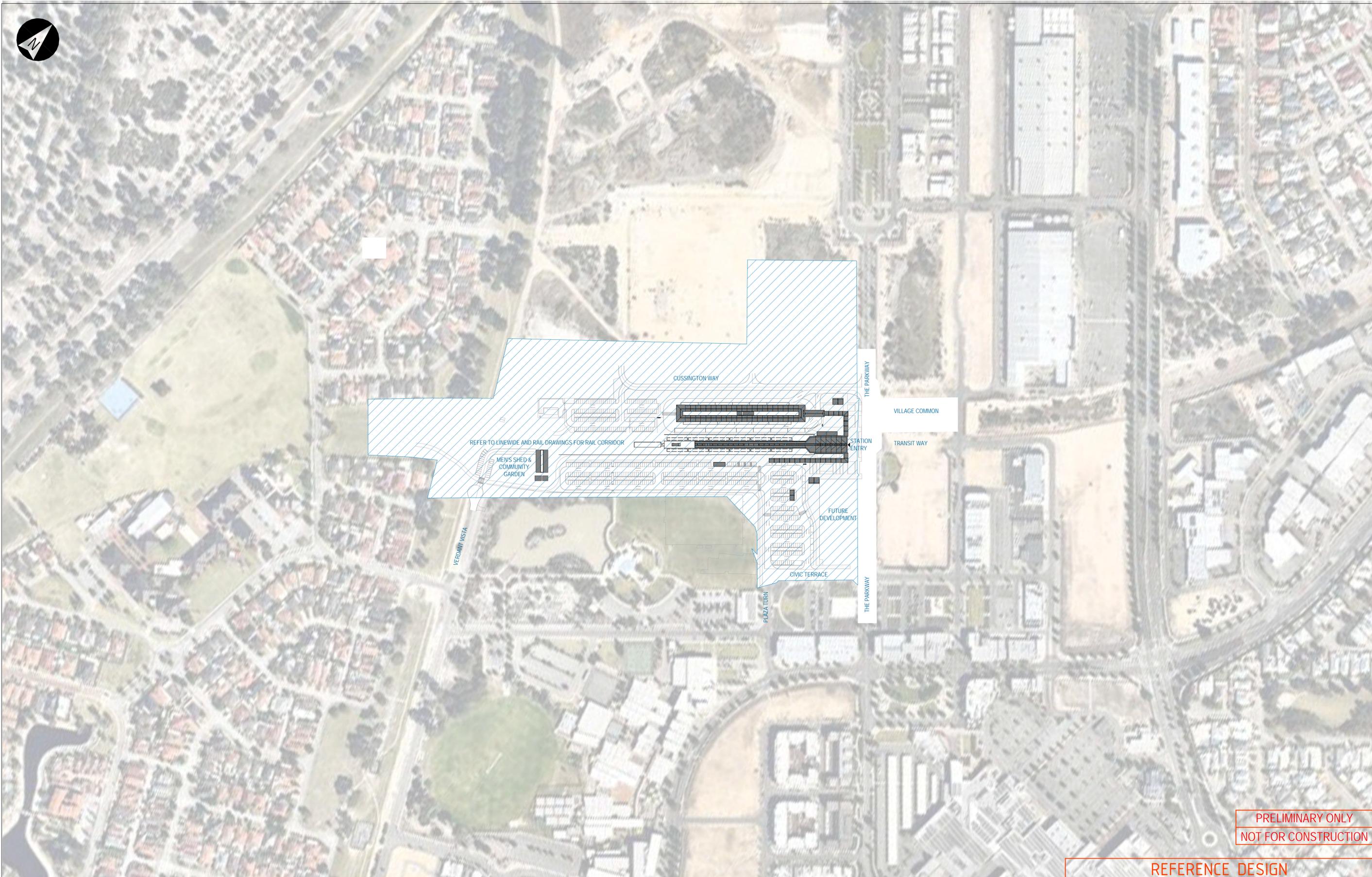
MORLEY ELLENBROOK LINE

ELLENBROOK STATION - ARCHITECTURE

OVERALL PLANS

LOCATION PLAN

PTA Drawing No: 25-A-291-AR0012 Rev: A

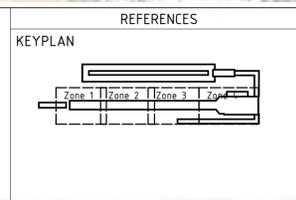


PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REFERENCE DESIGN

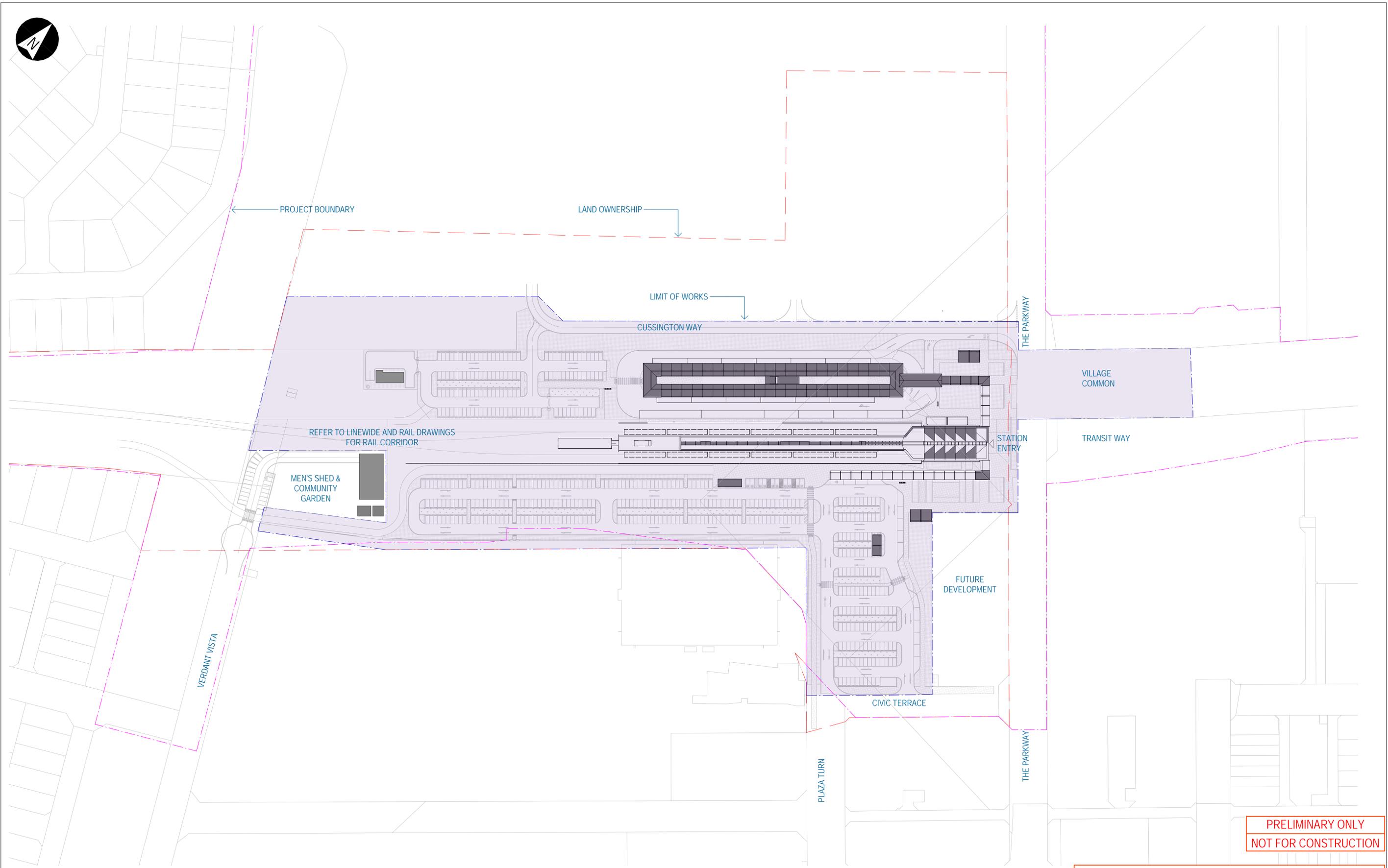
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A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	
REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
ORIG SIZE	0 10 20 30 40 50 100mm					
A1	AT ORIGINAL PLOT SIZE					

This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.



SCALE	1 : 2000	(@ A1)
DESIGNED	L.BOUDOU	
DRAWN	T.ALLAN	
CHECKED	C.TESTA	
APPROVED	M.ARAVIND	
DATE	07/06/21	
DATUM		
HORIZONTAL:	PCG2020	
VERTICAL:	AHD71	

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
OVERALL PLANS	
LAND OWNERSHIP PLAN	
PTA Drawing No: 25-A-291-AR0013	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

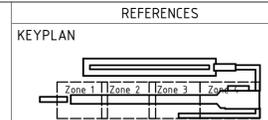
REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

0 10 20 30 40 50 100mm

This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.



SCALE  
1 : 1000 (@ A1)

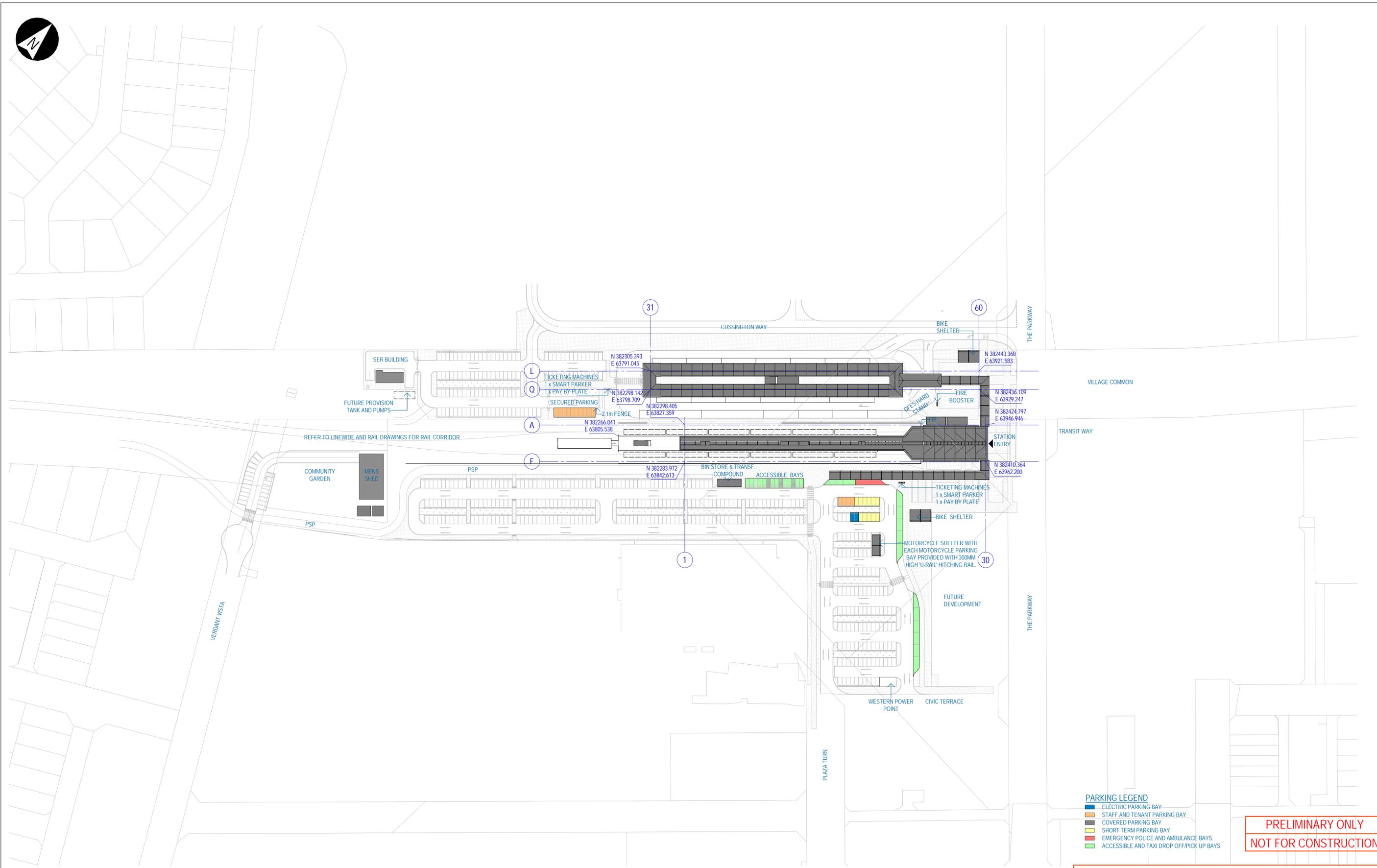
DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED L. BOUDOU  
DRAWN T. ALLAN  
CHECKED C. TESTA  
APPROVED M. MARAVIND  
DATE 07/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - ARCHITECTURE  
OVERALL PLANS  
LIMIT OF WORKS PLAN  
PTA Drawing No: 25-A-291-AR0014 Rev: A



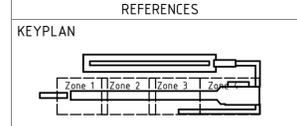
**PARKING LEGEND**

- ELECTRIC PARKING BAY
- STAFF AND TENANT PARKING BAY
- COVERED PARKING BAY
- SHORT TERM PARKING BAY
- EMERGENCY POLICE AND AMBULANCE BAYS
- ACCESSIBLE AND TAXI DROP OFF/PICK UP BAYS

**PRELIMINARY ONLY  
NOT FOR CONSTRUCTION**

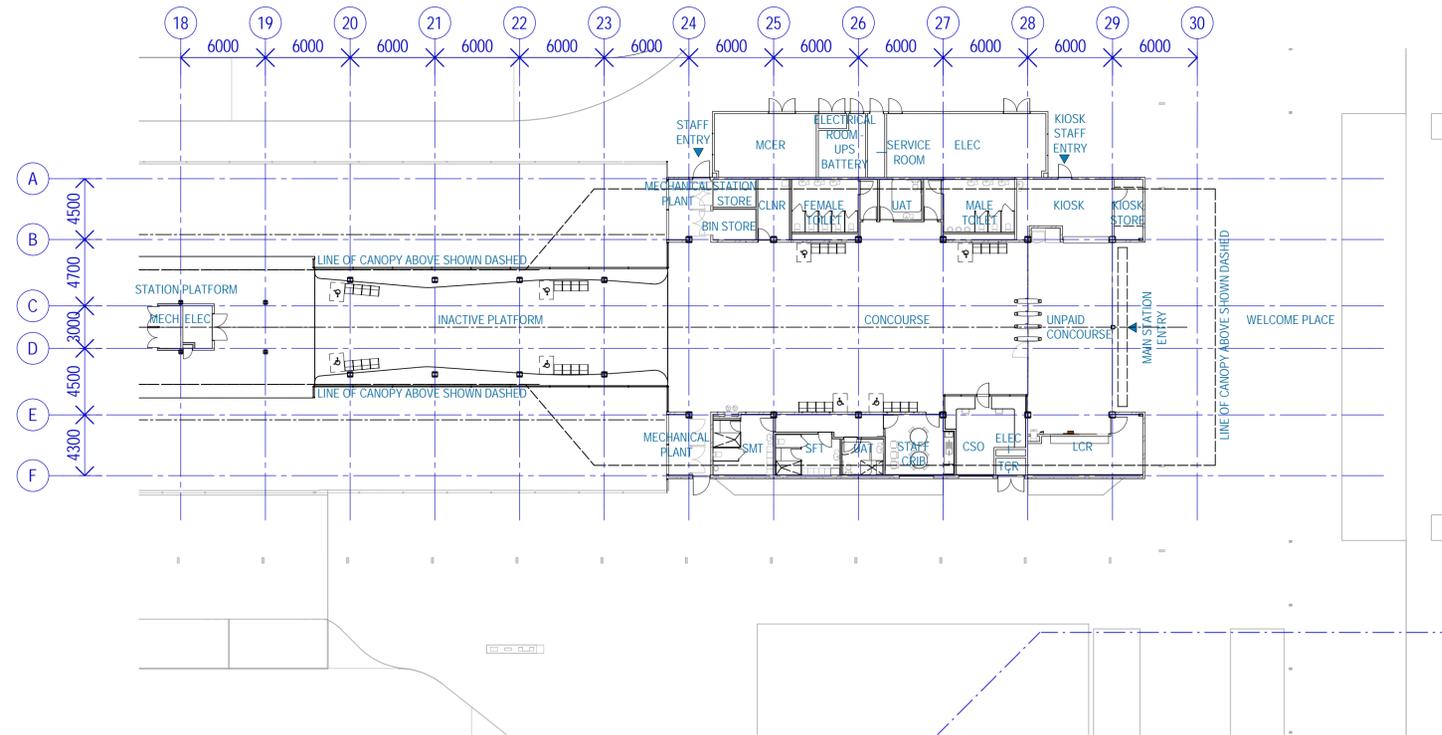
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A02	29/04/21	Issued for RD - IDC	LB	TA	CT					
A01	26/03/21	50% Reference Design	LB	TA	CT					
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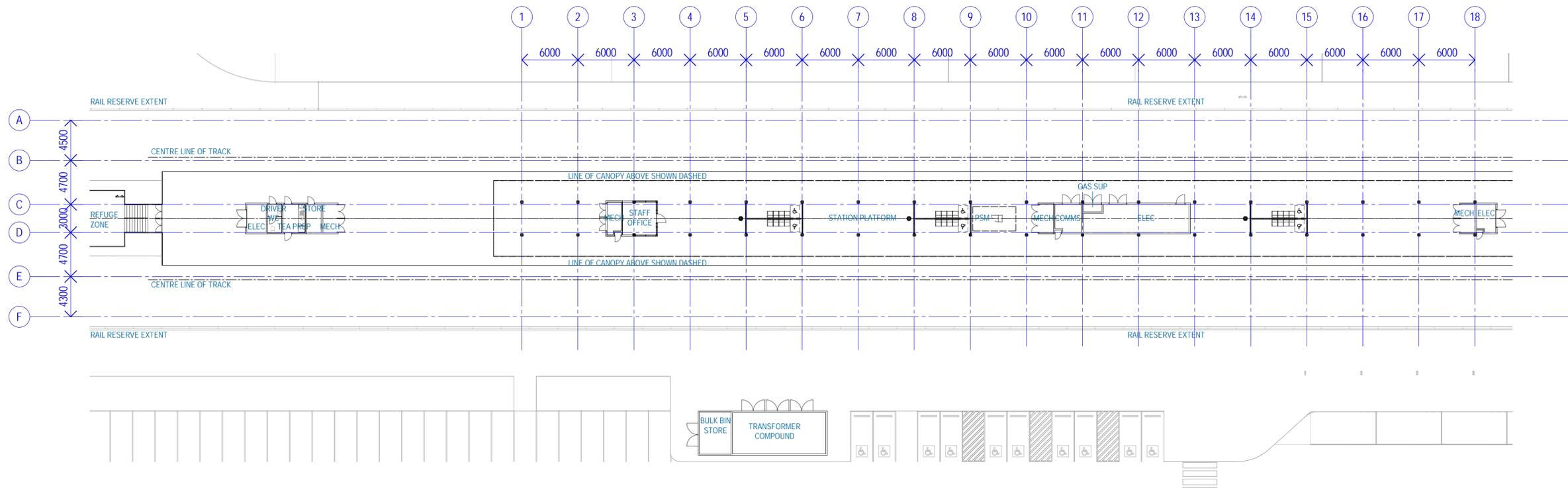


SCALE	1 : 1000 (@ A1)
DATUM	HORIZONTAL: PCG2020 VERTICAL: AHD71
DESIGNED	L. BOUDOU
DRAWN	T. ALLAN
CHECKED	C. TESTA
APPROVED	M. MARAVIND
DATE	07/06/21

	<b>MORLEY ELLENBROOK LINE</b>
<b>ELLENBROOK STATION - ARCHITECTURE</b>	
<b>OVERALL PLANS</b>	
<b>SITE PLAN AND GRID SETOUT</b>	
PTA Drawing No: 25-A-291-AR0015	Rev: A



1 OVERALL CONCOURSE PLAN  
SCALE 1 : 250



2 OVERALL PLATFORM PLAN  
SCALE 1 : 250

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

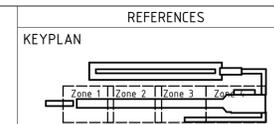
REFERENCE DESIGN

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A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

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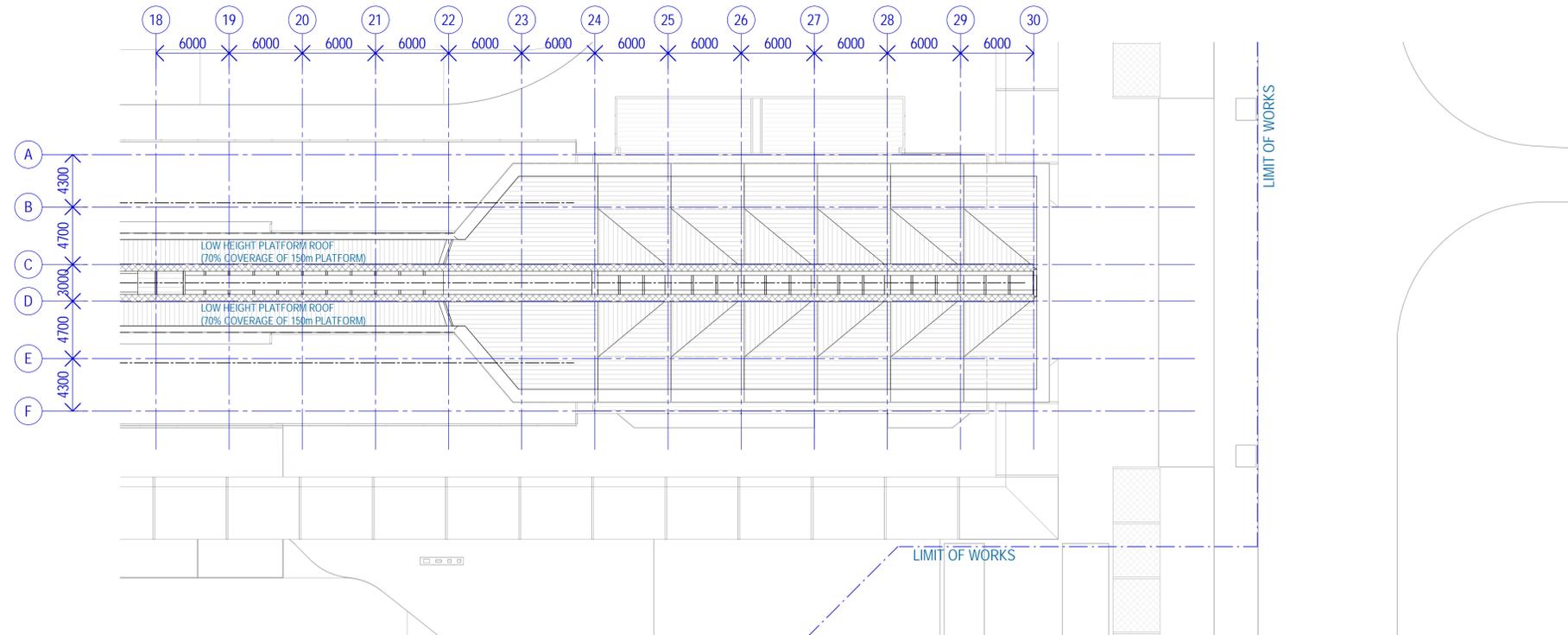
DATUM: HORIZONTAL: PCG2020 VERTICAL: AHD71

DESIGNED: L. BOUDOU  
DRAWN: T. ALLAN  
CHECKED: C. TESTA  
APPROVED: M. MARAVIND  
DATE: 07/06/21

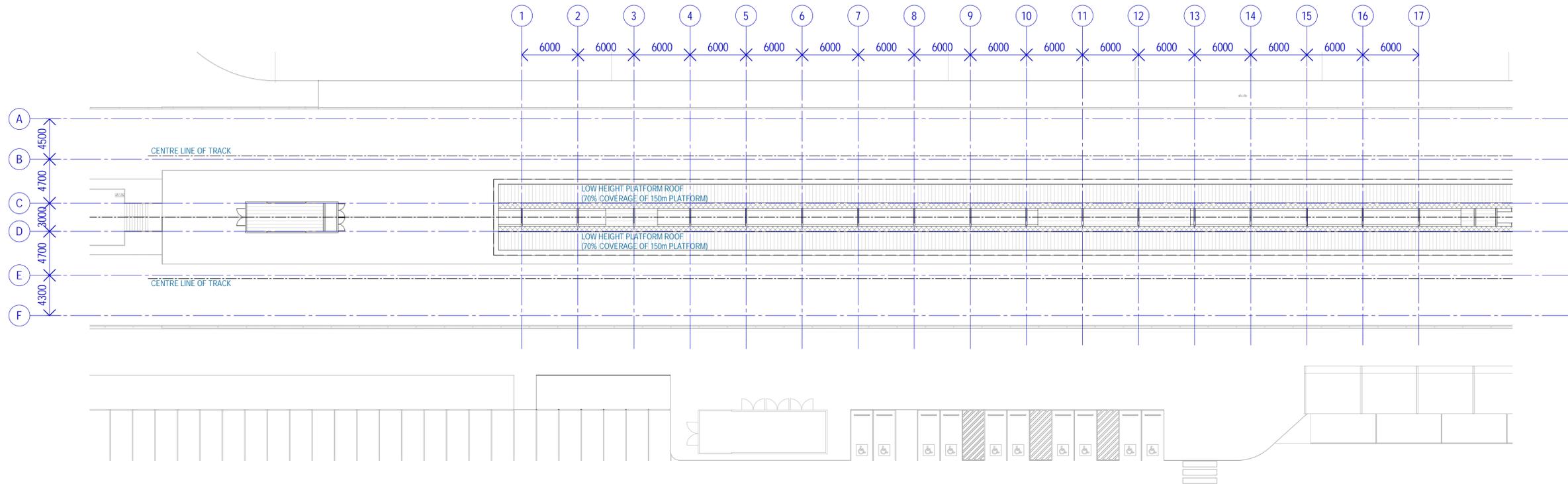
Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - ARCHITECTURE  
STATION OVERALL PLAN  
GROUND LEVEL  
PTA Drawing No: 25-A-291-AR0017 Rev: A



1 Station Roof Overall - Concourse  
SCALE 1 : 250



2 Station Roof Overall - Platform  
SCALE 1 : 250

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

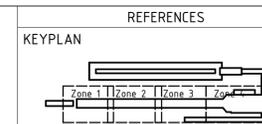
**REFERENCE DESIGN**

	MORLEY ELLENBROOK LINE
	ELLENBROOK STATION - ARCHITECTURE
STATION OVERALL PLAN	
ROOF	
PTA Drawing No: 25-A-291-AR0018	Rev: A

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

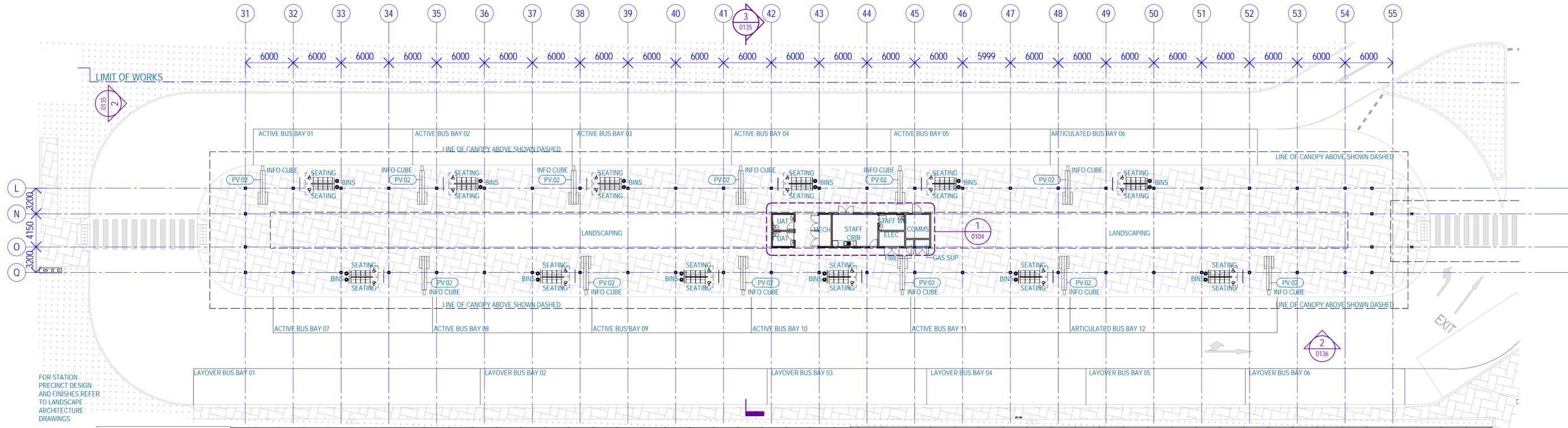
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SCALE  
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DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED: L. BOUDOU  
DRAWN: T. ALLAN  
CHECKED: C. TESTA  
APPROVED: M. MARAVIND  
DATE: 07/06/21



1 Bus Stand  
SCALE 1 : 250

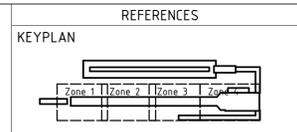
**WALL TYPE LEGEND**

- PD.01 - CEILING HEIGHT  
18/76/18 - 18MM CFC ON 76 STEEL STUD, FULL HEIGHT
- PD.02 - CEILING HEIGHT  
18/76 - 18MM CFC ON 76 STUD, LINING ON ONE SIDE ONLY, CEILING HEIGHT
- PD.03 - CEILING HEIGHT  
16/16/76/16 - FRL 120/120/120, 2X16MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT. \*MOISTURE RESISTANT LAYER WHERE ABUTTING WET AREAS
- PD.08 - CEILING HEIGHT  
110/76/18 - BRICK VENEER WITH 18MM CFC LINING ON 76 STUD
- PD.05 - CEILING HEIGHT  
16/76/16 - FRL /90/90, 16MM FIRE RATED PLASTERBOARD ON 76 STUD
- PD.07 - CEILING HEIGHT  
GLASS WALL
- PD.09 - CEILING HEIGHT  
110/76/13/13 - FRL /90/90, BRICK VENEER (90/90/90) WITH 2X13MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT.
- WALL INSULATION - REFER TO ESD REPORT FOR FURTHER DETAILS

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

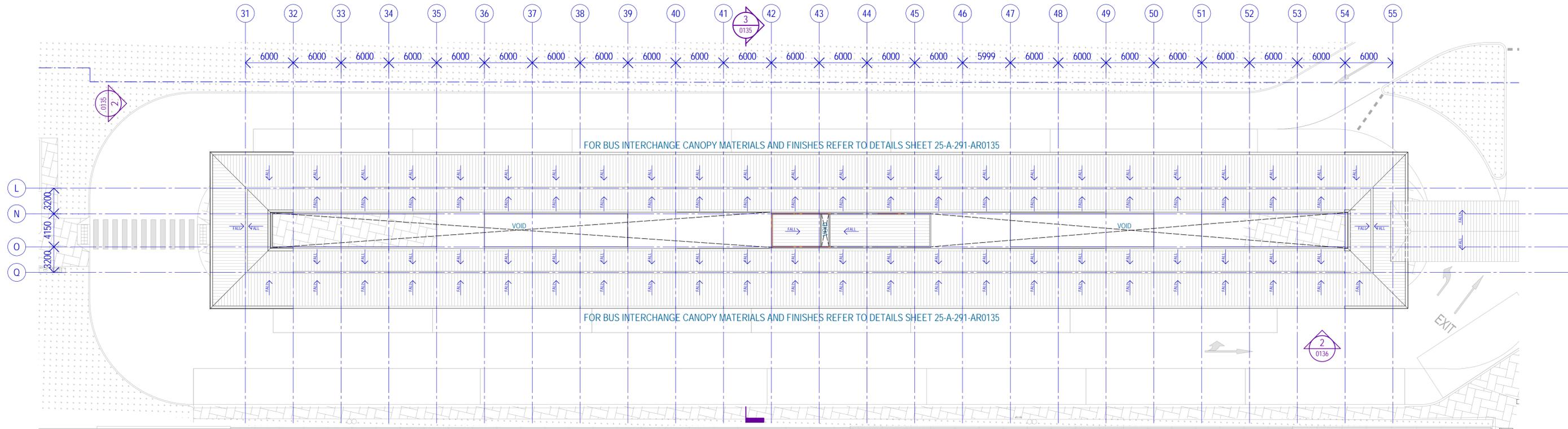
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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP			
ORIG SIZE	A1		0 10 20 30 40 50 100mm		This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.				
AT ORIGINAL PLOT SIZE									



SCALE	As indicated (@ A1)
DATUM	
HORIZONTAL:	PCG2020
VERTICAL:	AHD71
DESIGNED	L. BOUDOU
DRAWN	T. ALLAN
CHECKED	C. TESTA
APPROVED	M. MARAVIND
DATE	07/06/21

<b>MORLEY ELLENBROOK LINE</b>
<b>ELLENBROOK STATION - ARCHITECTURE</b> <b>BUS INTERCHANGE</b> <b>PLAN</b>
PTA Drawing No: <b>25-A-291-AR0019</b> Rev: <b>A</b>



1 Bus Stand Roof Overall  
SCALE 1 : 250

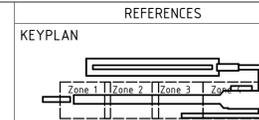
PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REFERENCE DESIGN

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A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE	0 10 20 30 40 50 100mm	This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.
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SCALE  
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DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

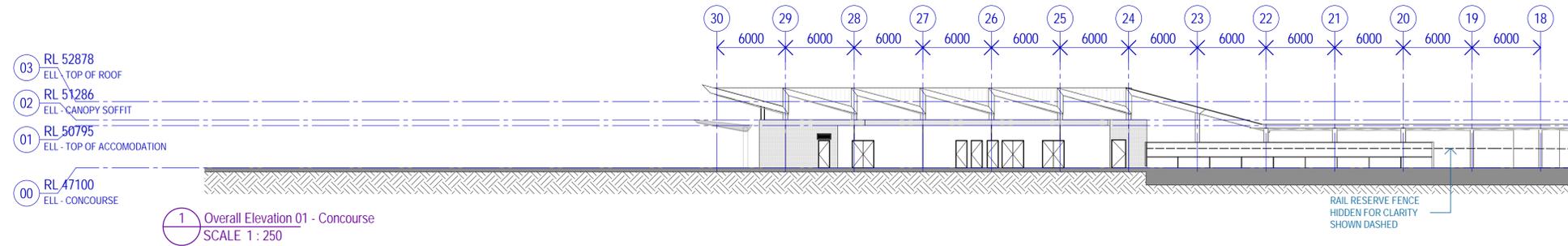
DESIGNED L. BOUDOU  
DRAWN T. ALLAN  
CHECKED C. TESTA  
APPROVED M. MARAVIND  
DATE 07/06/21

Government of Western Australia  
Public Transport Authority

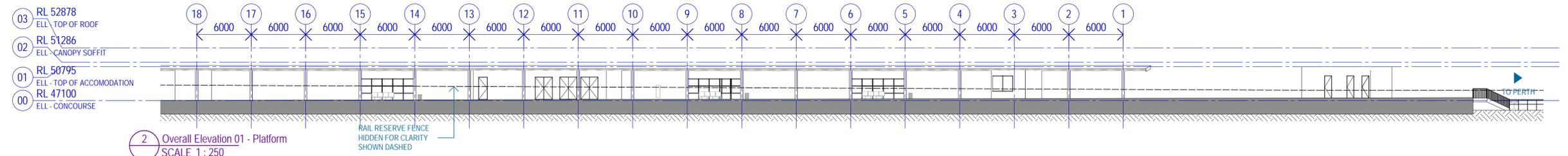
MORLEY ELLENBROOK LINE

ELLENBROOK STATION - ARCHITECTURE  
BUS INTERCHANGE  
ROOF PLAN

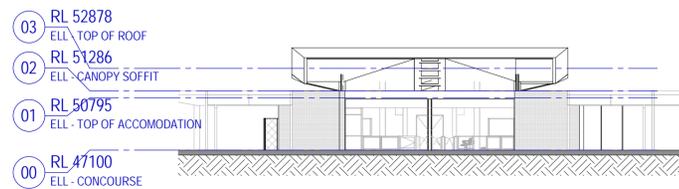
PTA Drawing No: 25-A-291-AR0020 Rev: A



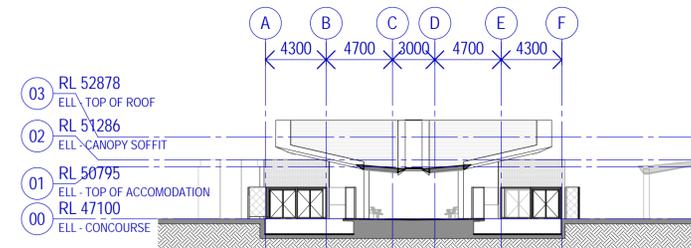
1 Overall Elevation 01 - Concourse  
SCALE 1 : 250



2 Overall Elevation 01 - Platform  
SCALE 1 : 250



3 Overall Elevation 03  
SCALE 1 : 250



4 Overall Elevation 04  
SCALE 1 : 250

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

**REFERENCE DESIGN**

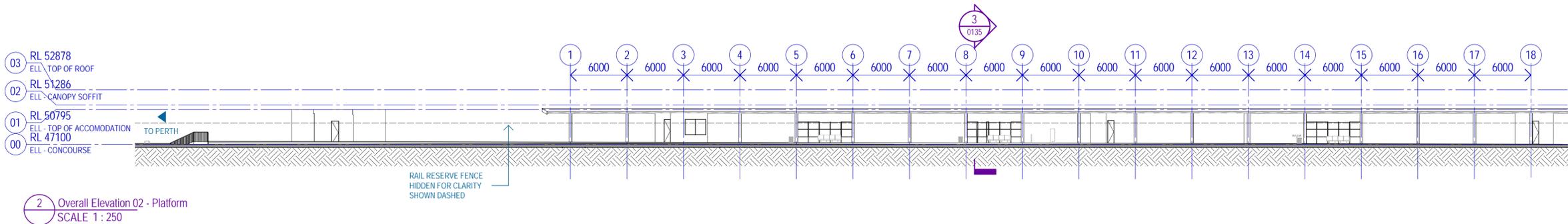
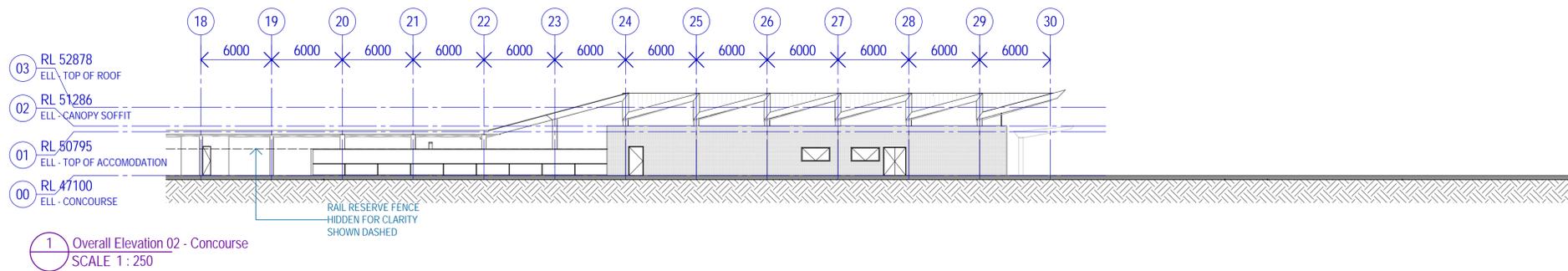
**MORLEY ELLENBROOK LINE**  
**ELLENBROOK STATION - ARCHITECTURE**  
**OVERALL ELEVATIONS**  
**STATION ELEVATION - SHEET 1**  
 PTA Drawing No: 25-A-291-AR0025 Rev: A

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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ORIG SIZE: A1  
 AT ORIGINAL PLOT SIZE  
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REFERENCES	SCALE	DESIGNED
	1 : 250 (@ A1)	L. BOUDOU
		DRAWN: T. ALLAN
		CHECKED: C. TESTA
		APPROVED: M. MARAVIND
		DATE: 07/06/21



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

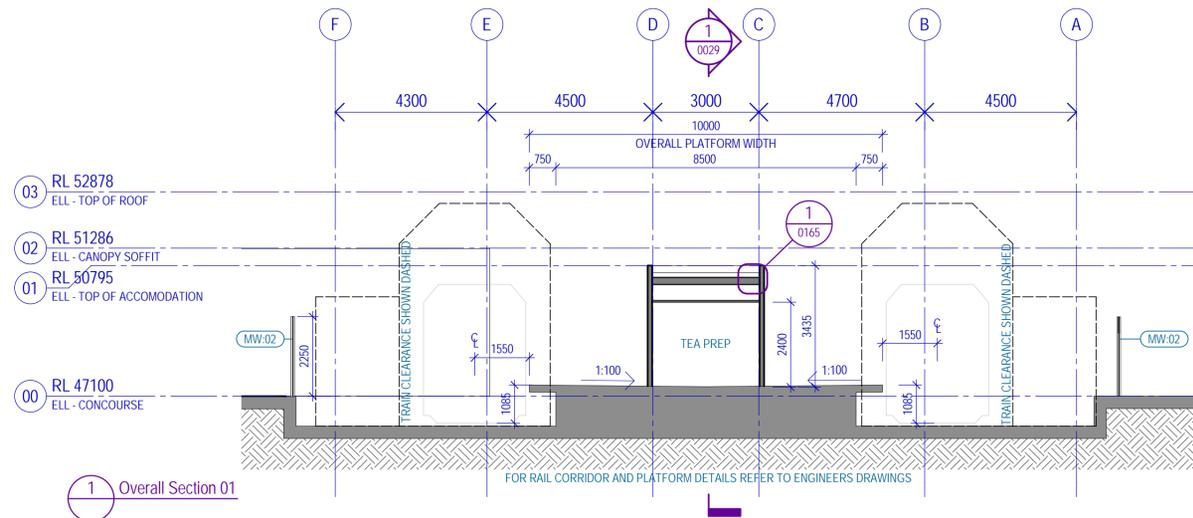
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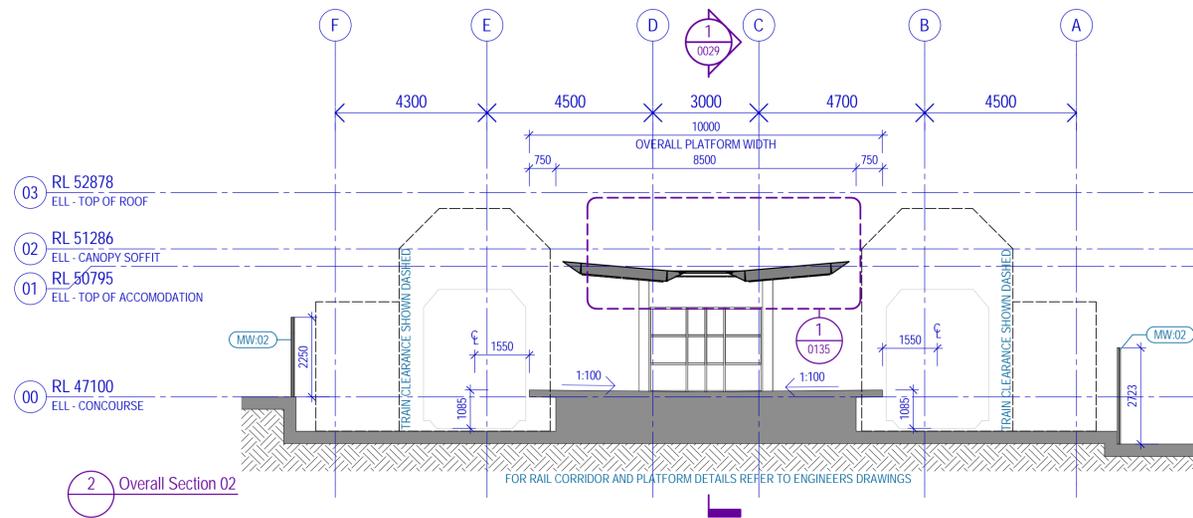


REFERENCES	SCALE 1 : 250 (@ A1)	DESIGNED L. BOUDOU
		DRAWN T. ALLAN
		CHECKED C. TESTA
	DATUM	APPROVED M. MARAVIND
	HORIZONTAL: PCG2020	DATE 07/06/21
	VERTICAL: AHD71	

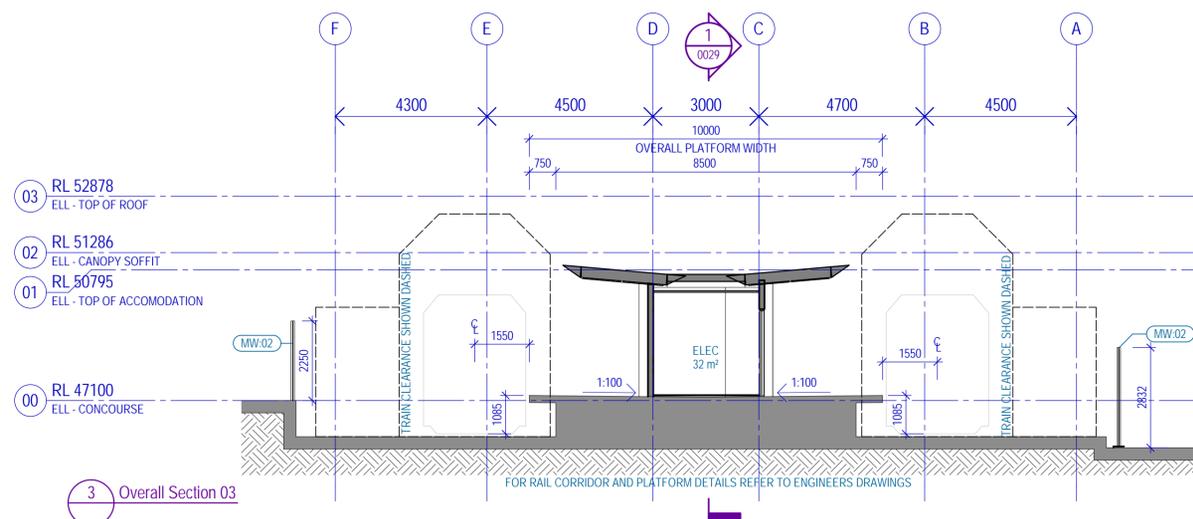
	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
OVERALL ELEVATIONS	
STATION ELEVATION - SHEET 2	
PTA Drawing No: 25-A-291-AR0026	Rev: A



1 Overall Section 01



2 Overall Section 02



3 Overall Section 03

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

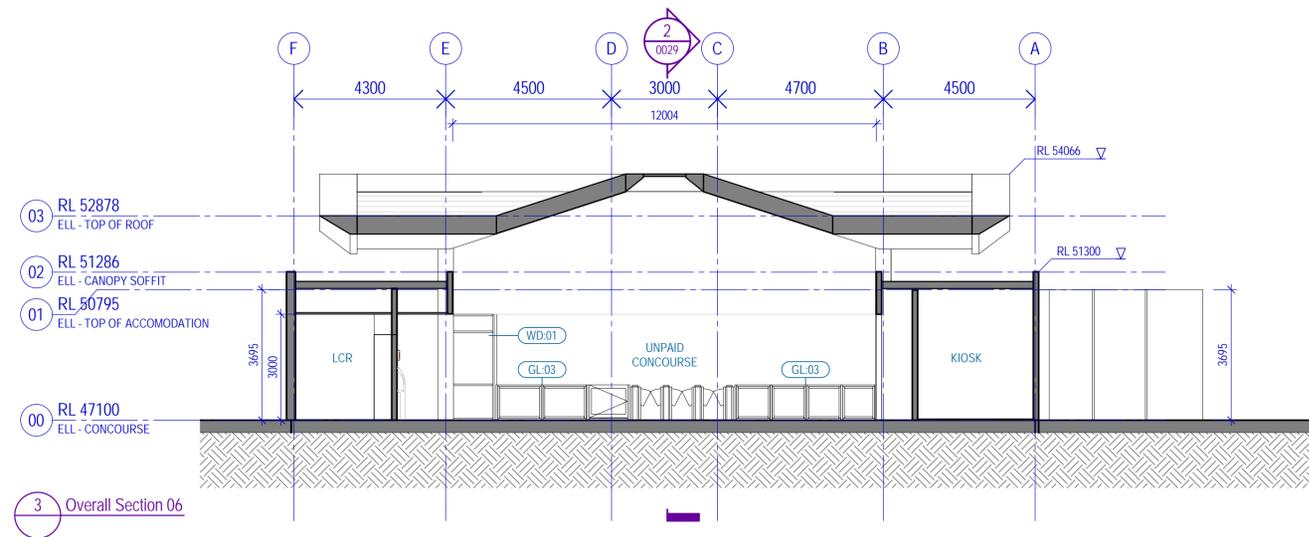
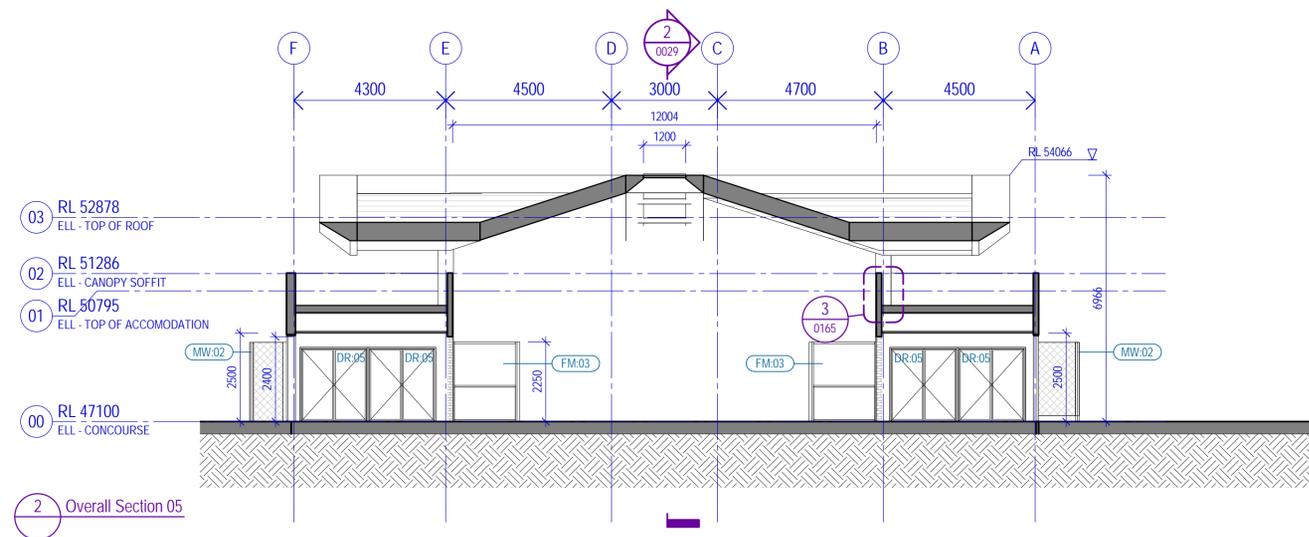
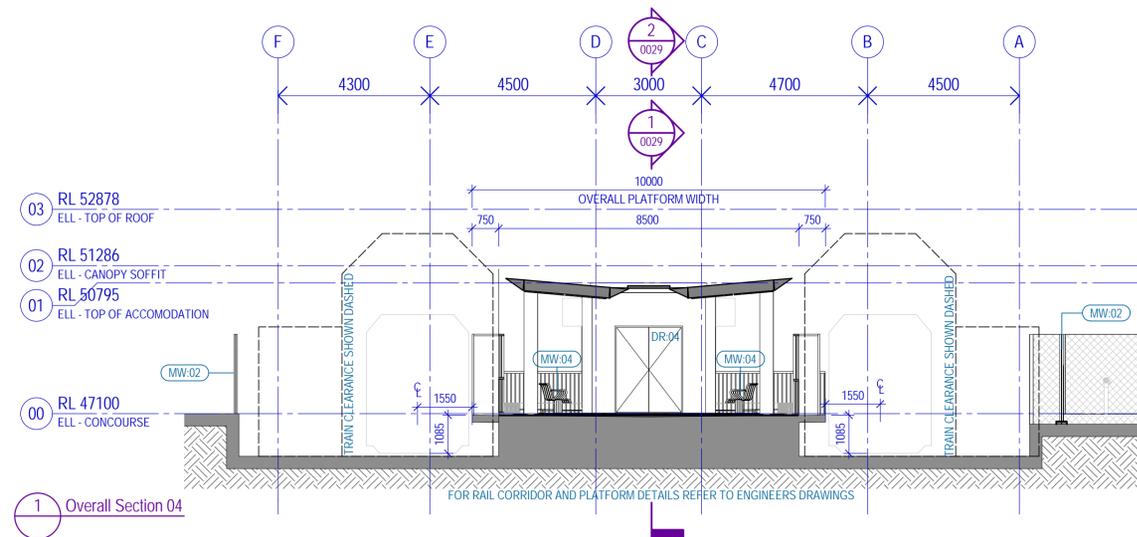
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A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
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REFERENCES	SCALE 1 : 100 (@ A1)	DESIGNED L. BOUDOU
	DATUM HORIZONTAL: PCG2020 VERTICAL: AHD71	DRAWN T. ALLAN
		CHECKED C. TESTA
		APPROVED M. ARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
OVERALL SECTIONS	
SECTIONS - SHEET 1	
PTA Drawing No: 25-A-291-AR0027	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

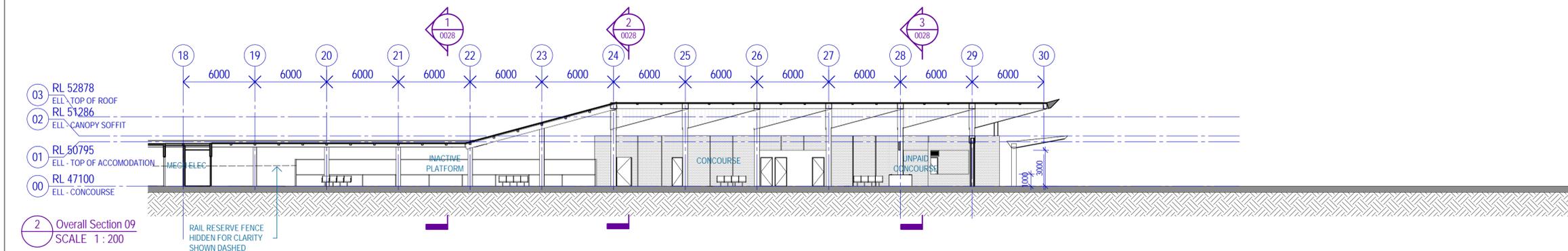
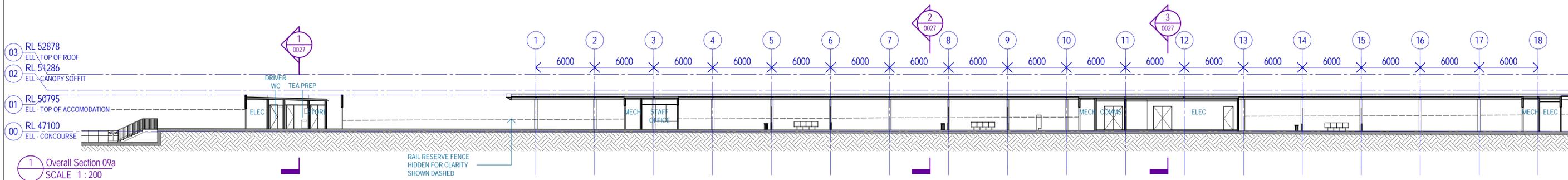
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REFERENCES	SCALE	DESIGNED
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	DATUM	DRAWN
	HORIZONTAL: PCG2020	T. ALLAN
	VERTICAL: AHD71	CHECKED
		C. TESTA
		APPROVED
		M. ARAVIND
		DATE
		07/06/21

		MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE		
OVERALL SECTIONS		
SECTIONS - SHEET 2		
PTA Drawing No:	25-A-291-AR0028	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REFERENCE DESIGN

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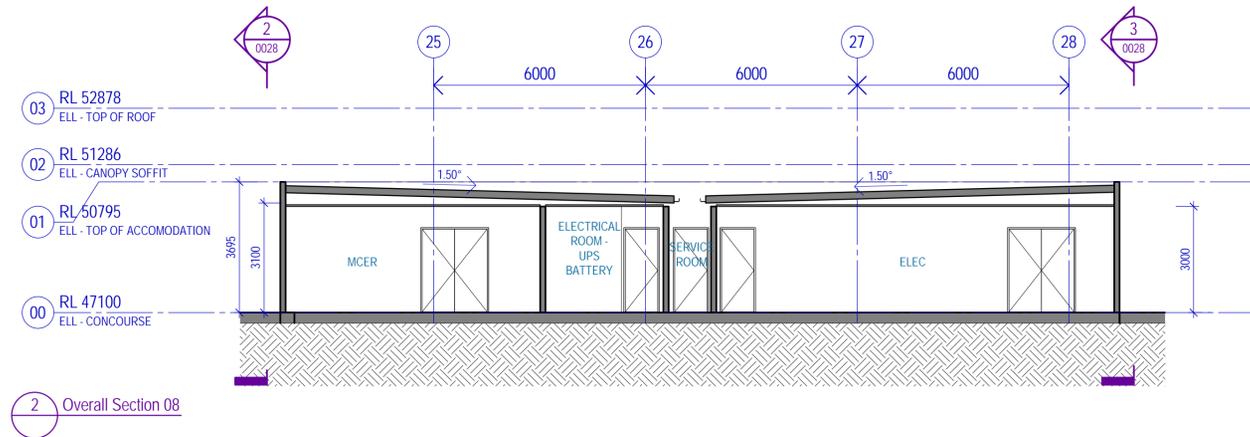
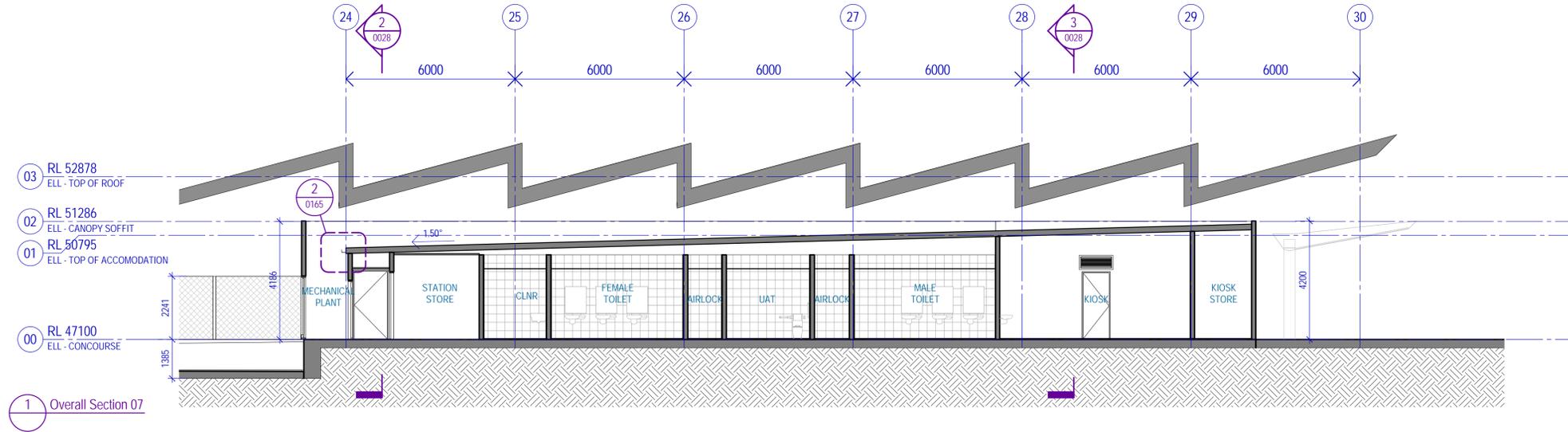
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REFERENCES	SCALE 1 : 200 (@ A1)	DESIGNED L.BOUDOU
	DATUM	DRAWN T.ALLAN
	HORIZONTAL: PCG2020	CHECKED C.TESTA
	VERTICAL: AHD71	APPROVED M.MARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
OVERALL SECTIONS	
SECTIONS - SHEET 3	
PTA Drawing No: 25-A-291-AR0029	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

**REFERENCE DESIGN**

		MORLEY ELLENBROOK LINE	
ELLENBROOK STATION - ARCHITECTURE			
OVERALL SECTIONS			
SECTIONS - SHEET 4			
PTA Drawing No: 25-A-291-AR0030		Rev: A	

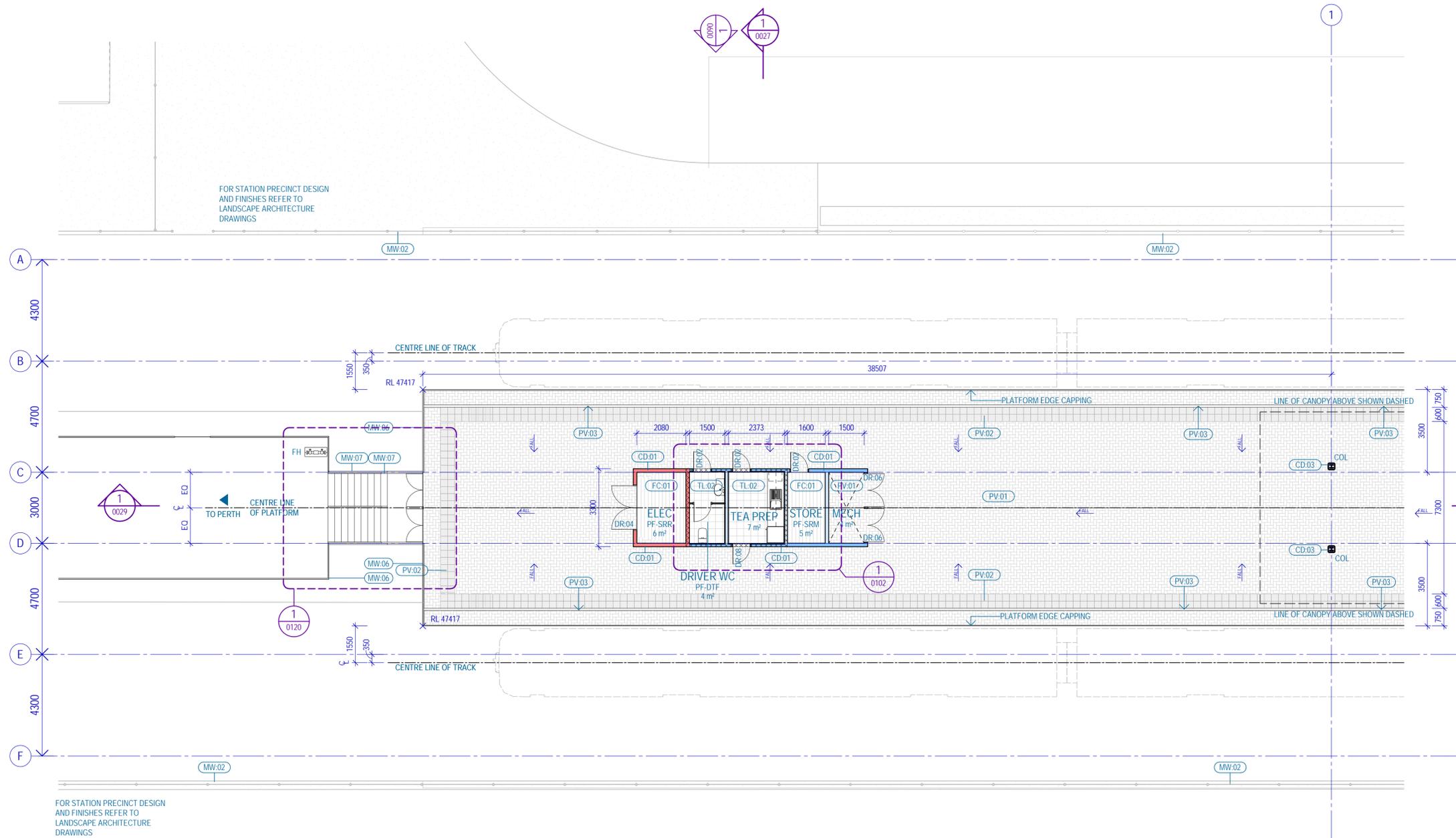
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ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

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REFERENCES	SCALE: 1 : 100 (@ A1)	DESIGNED: L. BOUDOU
	DATUM: HORIZONTAL: PCG2020, VERTICAL: AHD71	DRAWN: T. ALLAN
		CHECKED: C. TESTA
		APPROVED: M. MARAVIND
		DATE: 07/06/21



**WALL TYPE LEGEND**

- PD-01 - CEILING HEIGHT  
18/76/18 - 18MM CFC ON 76 STEEL STUD, FULL HEIGHT
- PD-02 - CEILING HEIGHT  
18/76 - 18MM CFC ON 76 STUD, LINING ON ONE SIDE ONLY, CEILING HEIGHT
- PD-03 - CEILING HEIGHT  
16/16/76/16/16 - FRL 120/120/120, 2X16MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT. \*MOISTURE RESISTANT LAYER WHERE ABUTTING WET AREAS
- PD-08 - CEILING HEIGHT  
110/76/18 - BRICK VENEER WITH 18MM CFC LINING ON 76 STUD
- PD-05 - CEILING HEIGHT  
16/76/16 - FRL -/90/90, 16MM FIRE RATED PLASTERBOARD ON 76 STUD
- PD-07 - GLASS WALL
- PD-09 - CEILING HEIGHT  
110/76/13/13 - FRL -/90/90, BRICK VENEER (90/90/90) WITH 2X13MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT.
- WALL INSULATION - REFER TO ESD REPORT FOR FURTHER DETAILS

FOR STATION PRECINCT DESIGN AND FINISHES REFER TO LANDSCAPE ARCHITECTURE DRAWINGS

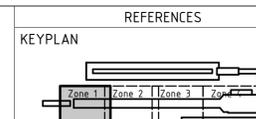
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NOT FOR CONSTRUCTION

REFERENCE DESIGN

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ORIG SIZE	0 10 20 30 40 50 100mm	This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.
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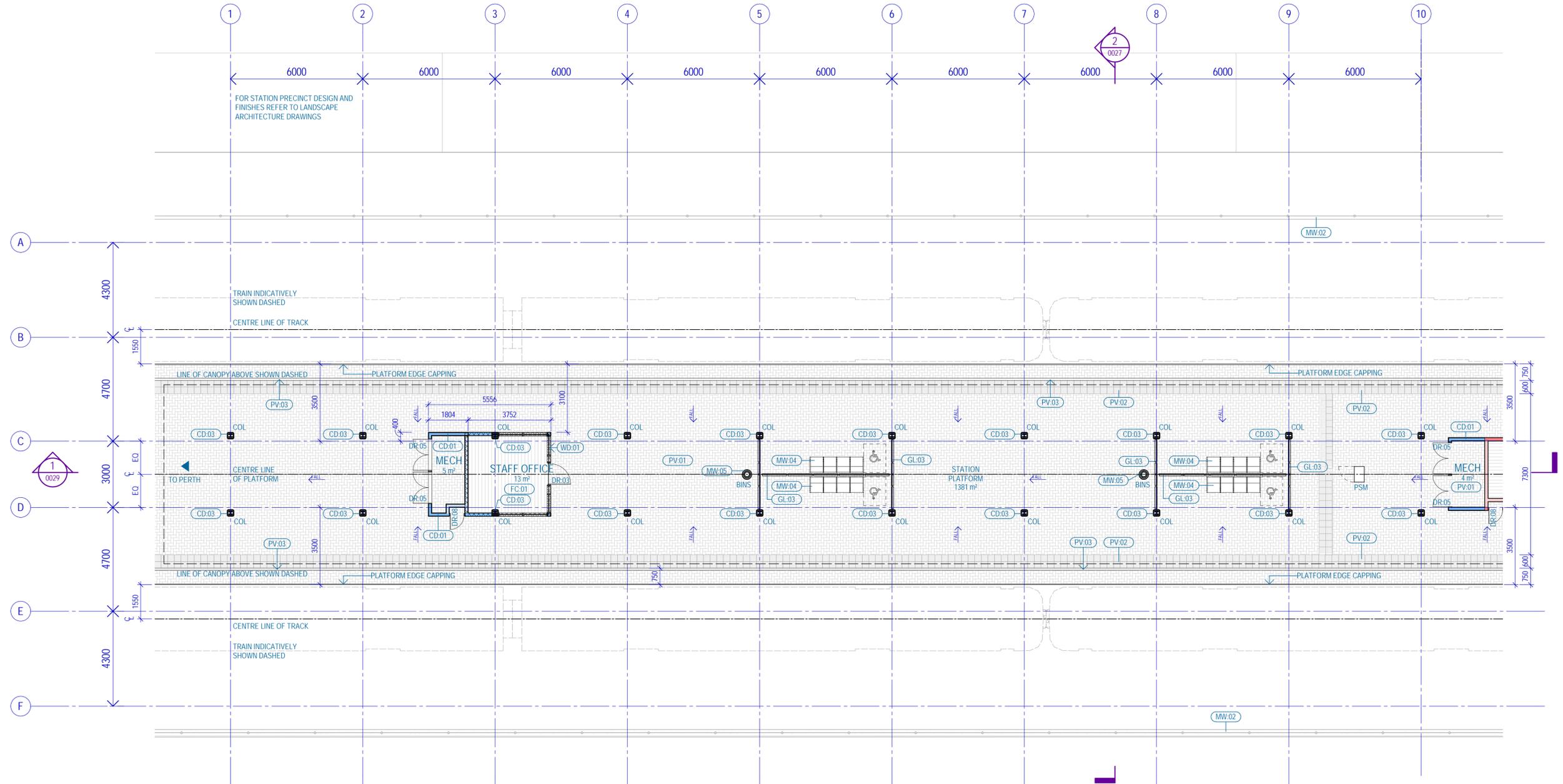
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DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED L. BOUDOU  
DRAWN T. ALLAN  
CHECKED C. TESTA  
APPROVED M. MARAVIND  
DATE 07/06/21

MORLEY ELLENBROOK LINE

**ELLENBROOK STATION - ARCHITECTURE**  
GENERAL ARRANGEMENT FLOOR PLAN  
PLATFORM LEVEL - SHEET 1  
PTA Drawing No: 25-A-291-AR0043 Rev: A



**WALL TYPE LEGEND**

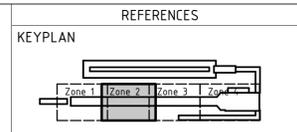
- PD-01 18/76/18 - 18MM CFC ON 76 STEEL STUD, FULL HEIGHT
- PD-02 18/76 - 18MM CFC ON 76 STUD, LINING ON ONE SIDE ONLY, CEILING HEIGHT
- PD-03 16/16/76/16/16 - FRL 120/120/120, 2X16MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT, \*MOISTURE RESISTANT LAYER WHERE ABUTTING WET AREAS
- PD-08 110/76/18 - BRICK VENEER WITH 18MM CFC LINING ON 76 STUD
- PD-05 16/76/16 - FRL -/90/90, 16MM FIRE RATED PLASTERBOARD ON 76 STUD
- PD-07 GLASS WALL
- PD-09 110/76/13/13 - FRL -/90/90, BRICK VENEER (90/90/90) WITH 2X13MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT.
- WALL INSULATION - REFER TO ESD REPORT FOR FURTHER DETAILS

FOR STATION PRECINCT DESIGN AND FINISHES  
REFER TO LANDSCAPE ARCHITECTURE  
DRAWINGS

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

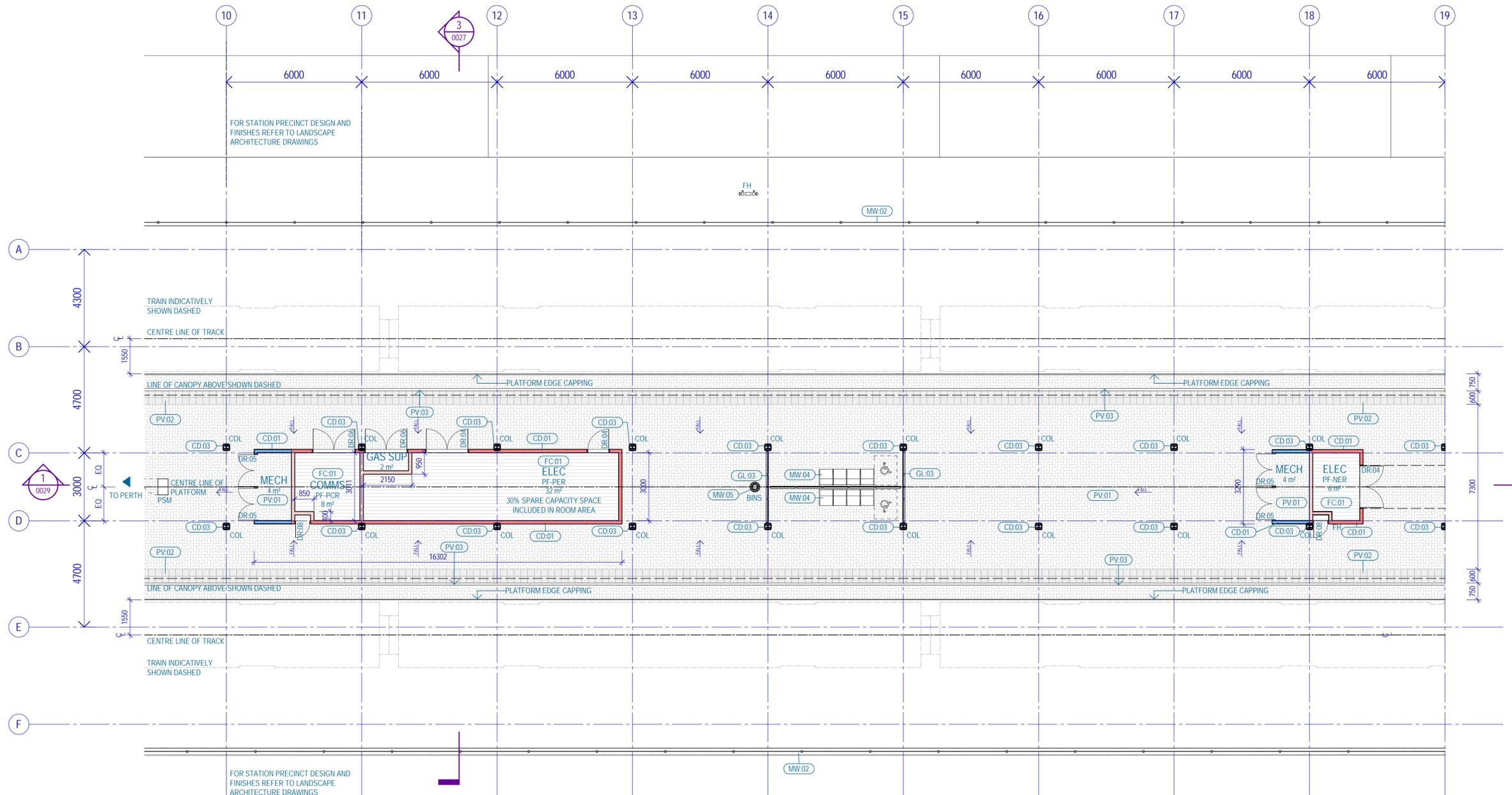
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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP				
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA				
A02	29/04/21	Issued for RD - IDC	LB	TA	CT					
A01	26/03/21	50% Reference Design	LB	TA	CT					
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SCALE	1 : 100 (@ A1)
DATUM	
HORIZONTAL:	PCG2020
VERTICAL:	AHD71
DESIGNED	L.BOUDOU
DRAWN	T.ALLAN
CHECKED	C.TESTA
APPROVED	M.ARAVIND
DATE	07/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
GENERAL ARRANGEMENT FLOOR PLAN	
PLATFORM LEVEL - SHEET 2	
PTA Drawing No: 25-A-291-AR0044	Rev: A



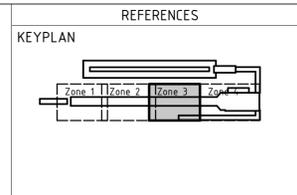
**WALL TYPE LEGEND**

- PD-01 - CEILING HEIGHT  
18/76/18 - 18MM CFC ON 76 STEEL STUD, FULL HEIGHT
- PD-02 - CEILING HEIGHT  
18/76 - 18MM CFC ON 76 STUD, LINING ON ONE SIDE ONLY, CEILING HEIGHT
- PD-03 - CEILING HEIGHT  
16/16/76/16/16 - FRL 120/120/120, 2X16MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT. \*MOISTURE RESISTANT LAYER WHERE ABUTTING WET AREAS
- PD-08 - CEILING HEIGHT  
110/76/18 - BRICK VENEER WITH 18MM CFC LINING ON 76 STUD
- PD-05 - CEILING HEIGHT  
16/76/16 - FRL -/90/90, 16MM FIRE RATED PLASTERBOARD ON 76 STUD
- PD-07  
GLASS WALL
- PD-09 - CEILING HEIGHT  
110/76/13/13 - FRL -/90/90, BRICK VENEER (90/90/90) WITH 2X13MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT.
- WALL INSULATION - REFER TO ESD REPORT FOR FURTHER DETAILS

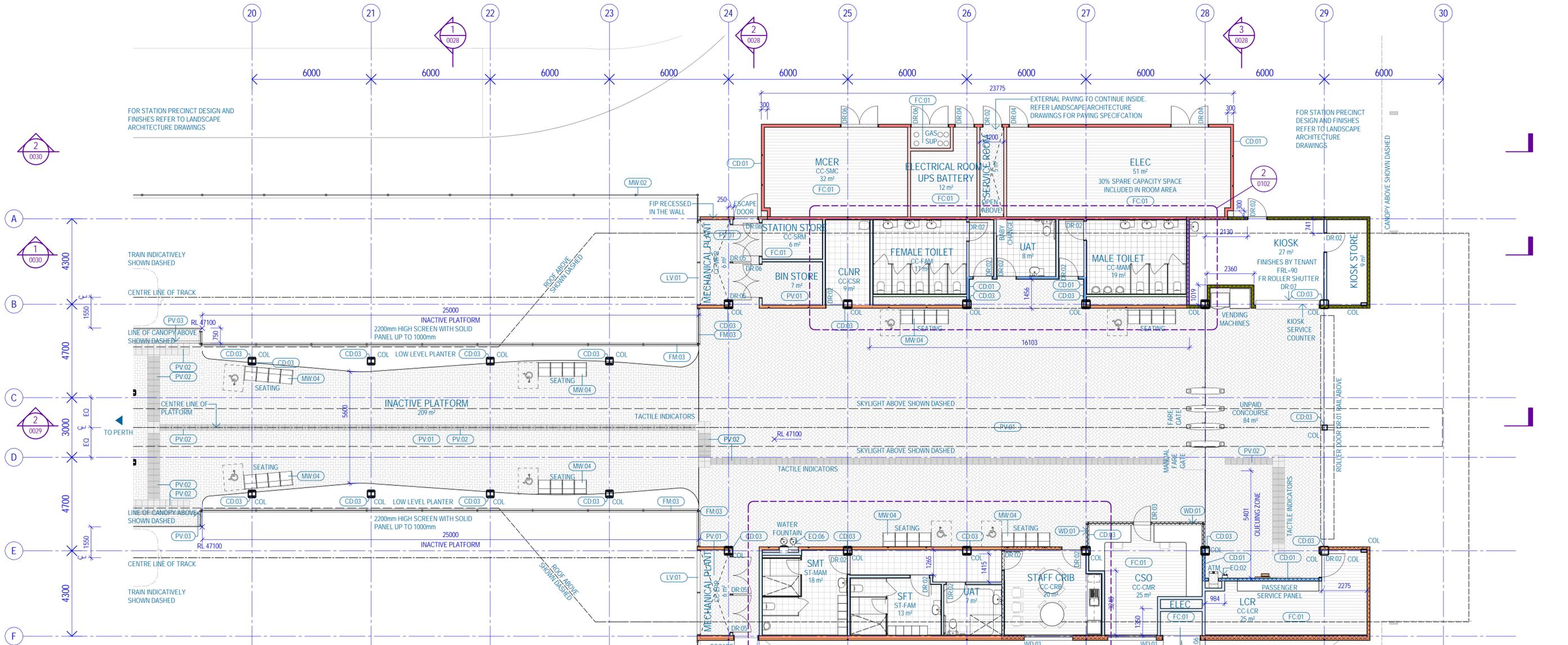
PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

<b>REFERENCE DESIGN</b>	
	<b>MORLEY ELLENBROOK LINE</b>
<b>ELLENBROOK STATION - ARCHITECTURE</b> <b>GENERAL ARRANGEMENT FLOOR PLAN</b> <b>PLATFORM LEVEL - SHEET 3</b> <b>PTA Drawing No: 25-A-291-AR0045</b>	
DESIGNED: L. BOUDOU DRAWN: T. ALLAN CHECKED: C. TESTA APPROVED: M. ARAVIND DATE: 07/06/21	Rev: <b>A</b>

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP				
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA				
A02	29/04/21	Issued for RD - IDC	LB	TA	CT					
A01	26/03/21	50% Reference Design	LB	TA	CT					
ORIG SIZE: <b>A1</b> AT ORIGINAL PLOT SIZE										
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SCALE	1 : 100 (@ A1)
DATUM	
HORIZONTAL:	PCG2020
VERTICAL:	AHD71



**WALL TYPE LEGEND**

- PD-01 18/76/18 - 18MM CFC ON 76 STEEL STUD, FULL HEIGHT
- PD-02 18/76 - 18MM CFC ON 76 STUD, LINING ON ONE SIDE ONLY, CEILING HEIGHT
- PD-03 16/16/76/16/16 - FRL 120/120/120, 2X16MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT. \*MOISTURE RESISTANT LAYER WHERE ABUTTING WET AREAS
- PD-08 110/76/18 - BRICK VENEER WITH 18MM CFC LINING ON 76 STUD
- PD-05 16/76/16 - FRL -/90/90, 16MM FIRE RATED PLASTERBOARD ON 76 STUD
- PD-07 GLASS WALL
- PD-09 110/76/13/13 - FRL -/90/90, BRICK VENEER (90/90/90) WITH 2X13MM FIRE RATED PLASTERBOARD ON 76 STUD, FULL HEIGHT.

FOR STATION PRECINCT DESIGN AND FINISHES REFER TO LANDSCAPE ARCHITECTURE DRAWINGS

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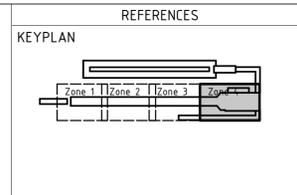
**REFERENCE DESIGN**

**MORLEY ELLENBROOK LINE**  
**ELLENBROOK STATION - ARCHITECTURE**  
**GENERAL ARRANGEMENT FLOOR PLAN**  
**CONCOURSE LEVEL - SHEET 1**  
 PTA Drawing No: 25-A-291-AR0046 Rev: A

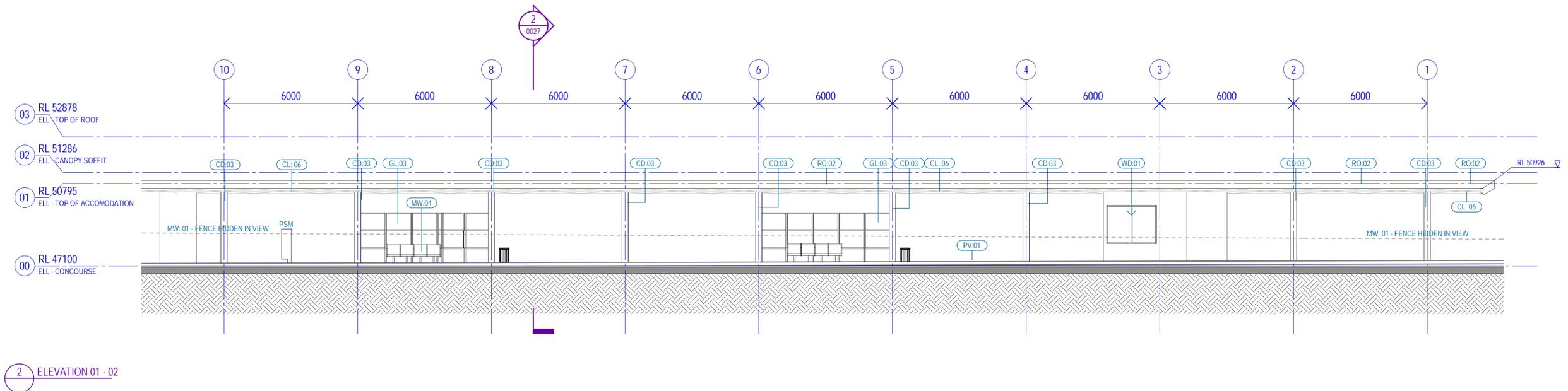
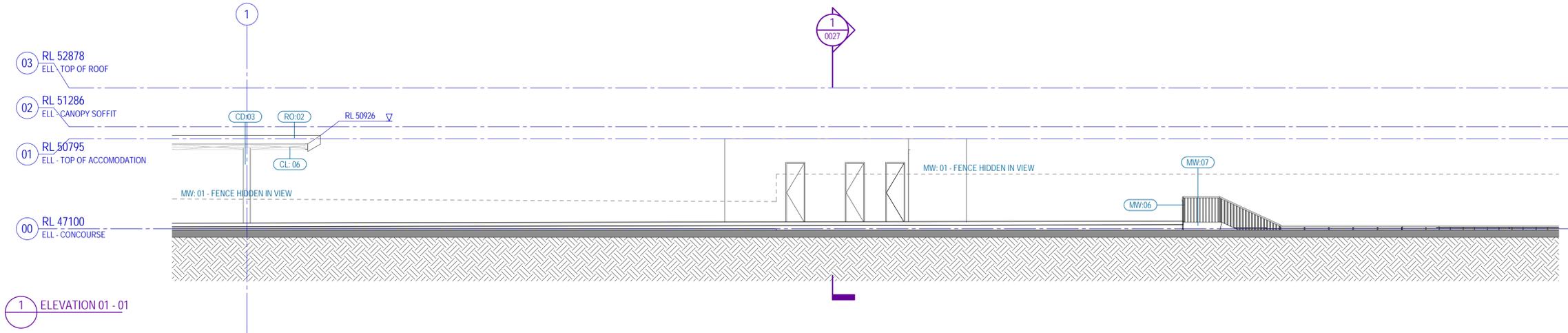
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A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
A01	26/03/21	50% Reference Design	LB	TA	CT	

ORIG SIZE:  100mm

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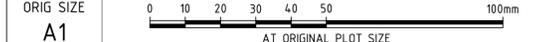
SCALE	1 : 100 (@ A1)
DESIGNED	L. BOUDOU
DRAWN	T. ALLAN
CHECKED	C. TESTA
APPROVED	M. MARAVIND
DATE	07/06/21



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**REFERENCE DESIGN**

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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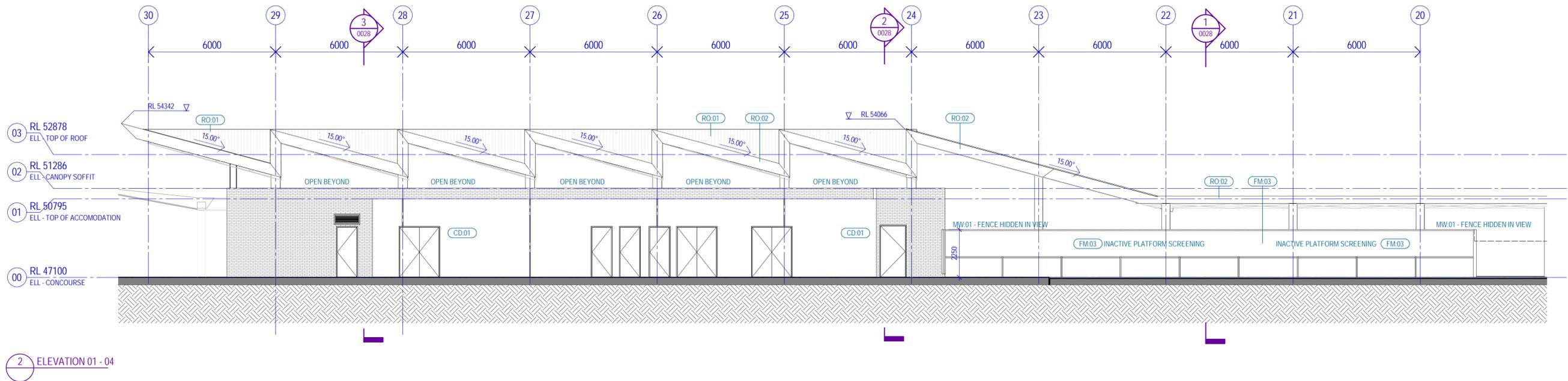
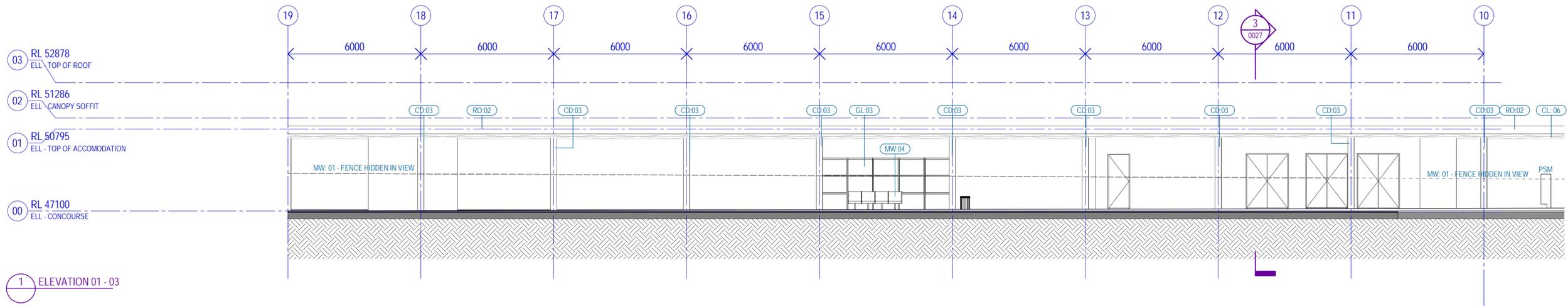


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REFERENCES	SCALE 1 : 100 (@ A1)	DESIGNED L. BOUDOU
	DATUM	DRAWN T. ALLAN
	HORIZONTAL: PCG2020	CHECKED C. TESTA
	VERTICAL: AHD71	APPROVED M. MARAVIND
		DATE 07/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
GENERAL ARRANGEMENT	
ELEVATION - SHEET 1	
PTA Drawing No: 25-A-291-AR0090	Rev: A



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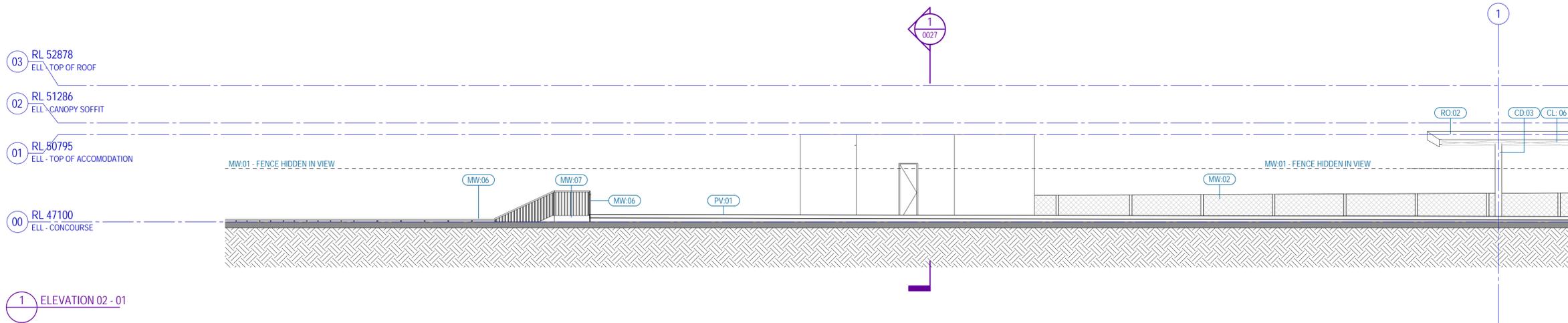
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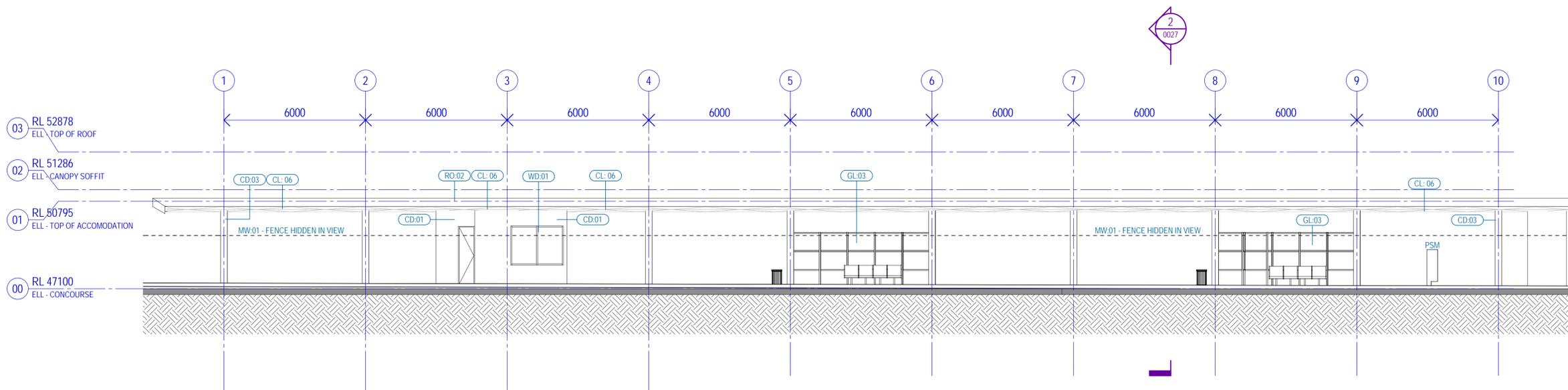


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	DATUM	DRAWN T. ALLAN
	HORIZONTAL: PCG2020	CHECKED C. TESTA
	VERTICAL: AHD71	APPROVED M. MARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
GENERAL ARRANGEMENT	
ELEVATION - SHEET 2	
PTA Drawing No: 25-A-291-AR0091	Rev: A



1 ELEVATION 02 - 01



2 ELEVATION 02 - 02

PRELIMINARY ONLY  
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REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
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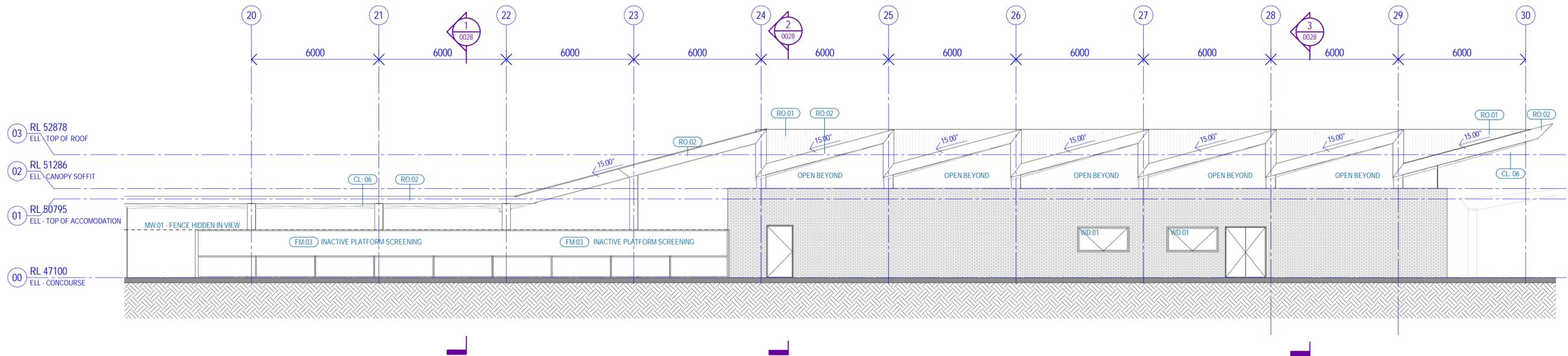
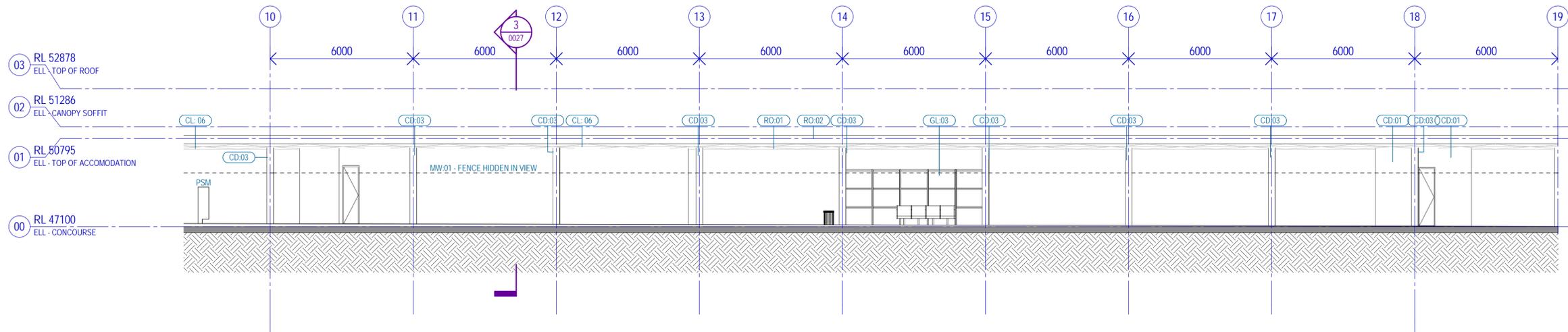
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AT ORIGINAL PLOT SIZE

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REFERENCES	SCALE 1 : 100 (@ A1)	DESIGNED L. BOUDOU
	DATUM	DRAWN T. ALLAN
	HORIZONTAL: PCG2020	CHECKED C. TESTA
	VERTICAL: AHD71	APPROVED M. MARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
GENERAL ARRANGEMENT	
ELEVATION - SHEET 3	
PTA Drawing No: 25-A-291-AR0092	Rev: A



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REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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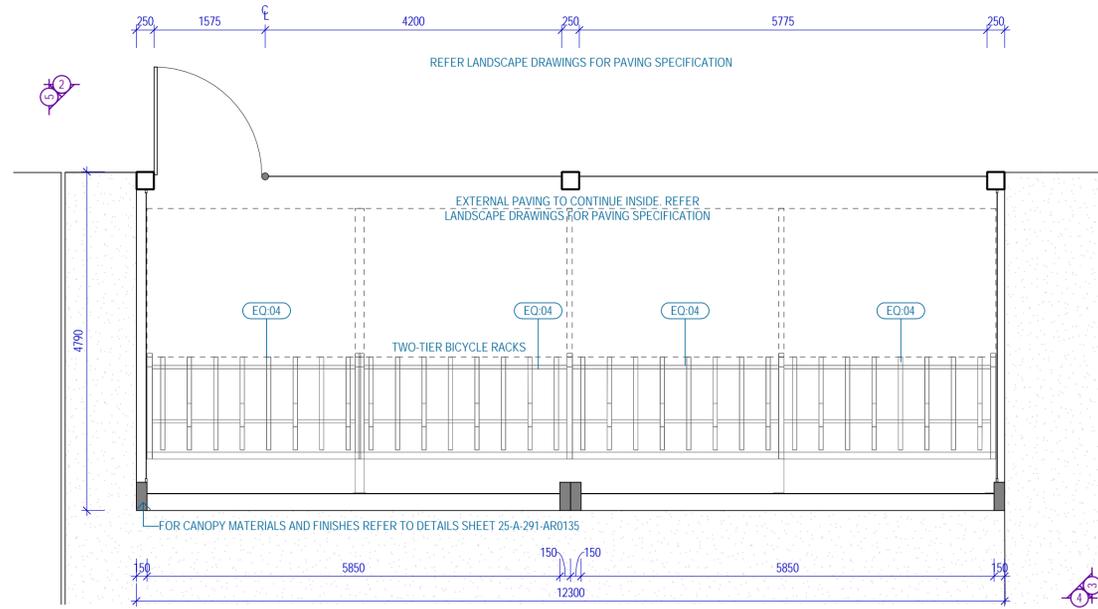
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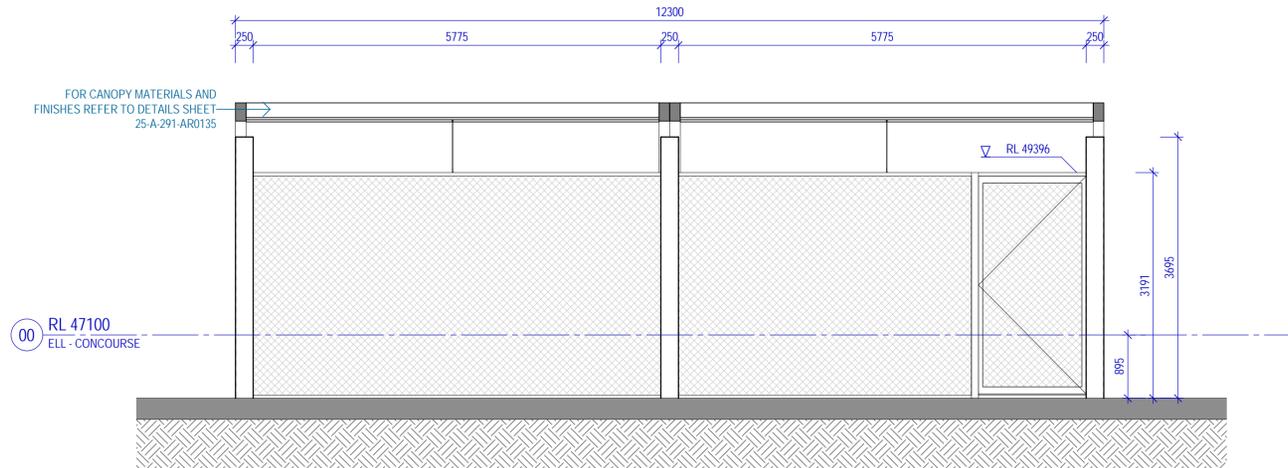


REFERENCES	SCALE 1 : 100 (@ A1)	DESIGNED L. BOUDOU	DRAWN T. ALLAN
	DATUM	CHECKED C. TESTA	APPROVED M. MARAVIND
	HORIZONTAL: PCG2020 VERTICAL: AHD71	DATE 07/06/21	

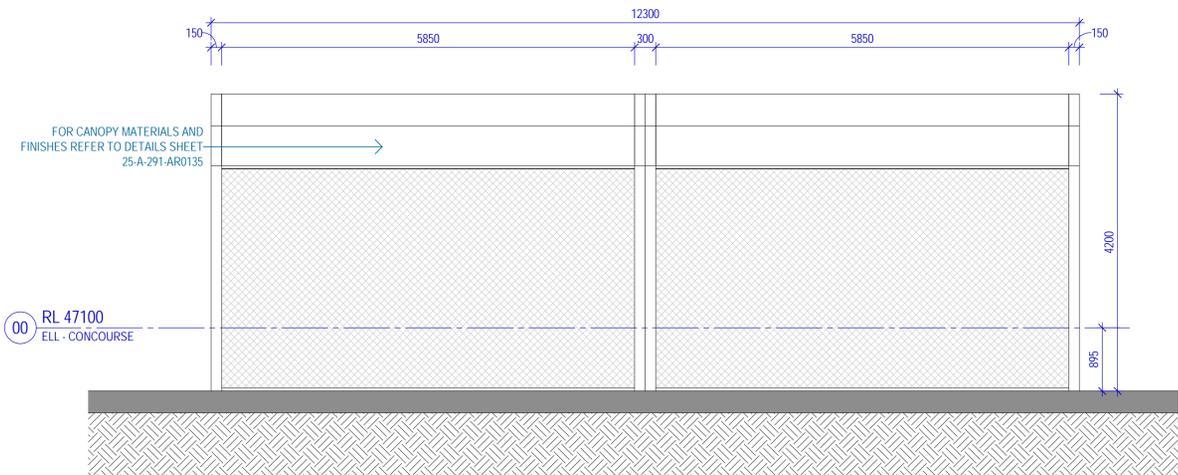
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 ELLENBROOK STATION - ARCHITECTURE  
 GENERAL ARRANGEMENT  
 ELEVATION - SHEET 4  
 PTA Drawing No: 25-A-291-AR0093 Rev: A



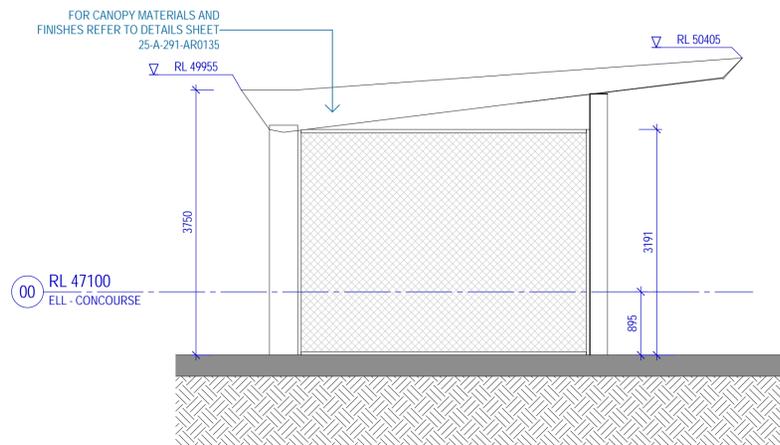
1 BIKE STORE PLAN  
SCALE 1 : 50



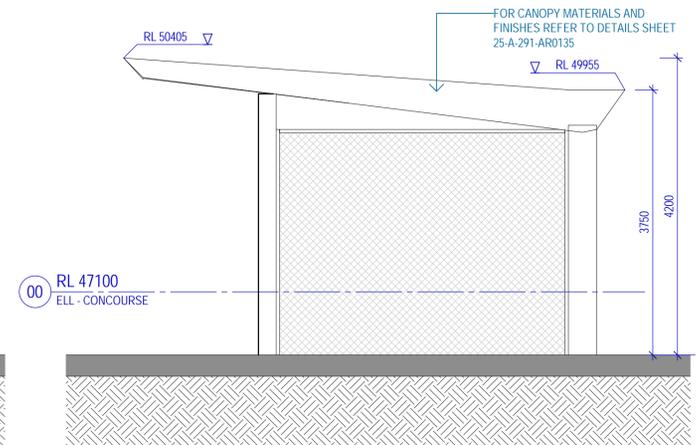
2 BIKE STORE ELEVATION 01



4 BIKE STORE ELEVATION 03



3 BIKE STORE ELEVATION 02



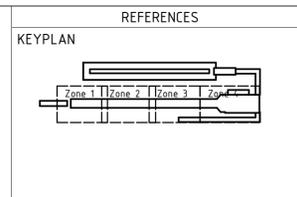
5 BIKE STORE ELEVATION 04

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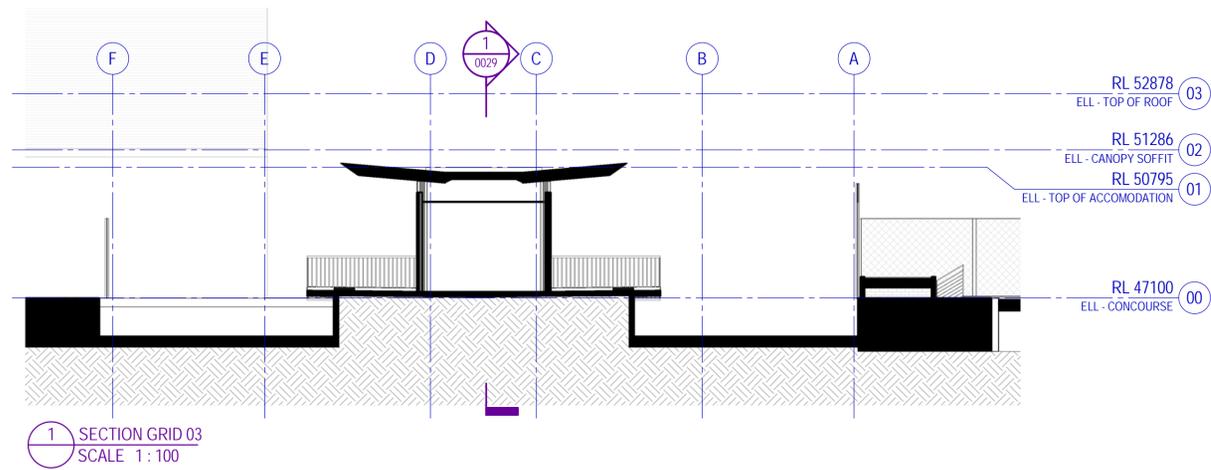
**REFERENCE DESIGN**

		<b>MORLEY ELLENBROOK LINE</b>	
<b>ELLENBROOK STATION - ARCHITECTURE</b>			
<b>ENLARGED PLANS</b>			
<b>BICYCLE SHELTER PLAN AND ELEVATIONS</b>			
<b>PTA Drawing No: 25-A-291-AR0101</b>			<b>Rev: A</b>

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A01	29/04/21	Issued for RD - IDC	LB	TA	CT	
ORIG SIZE			<small>This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.</small>			
<b>A1</b>	<small>AT ORIGINAL PLOT SIZE</small>					



SCALE	1 : 50 (@ A1)
DESIGNED	L. BOUDOU
DRAWN	T. ALLAN
CHECKED	C. TESTA
APPROVED	M. MARAVIND
DATE	07/06/21
DATUM	
HORIZONTAL:	PCG2020
VERTICAL:	AHD71



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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A01	29.04.21	Issued for RD - IDC	LB	TA	CT	

ORIG SIZE A1

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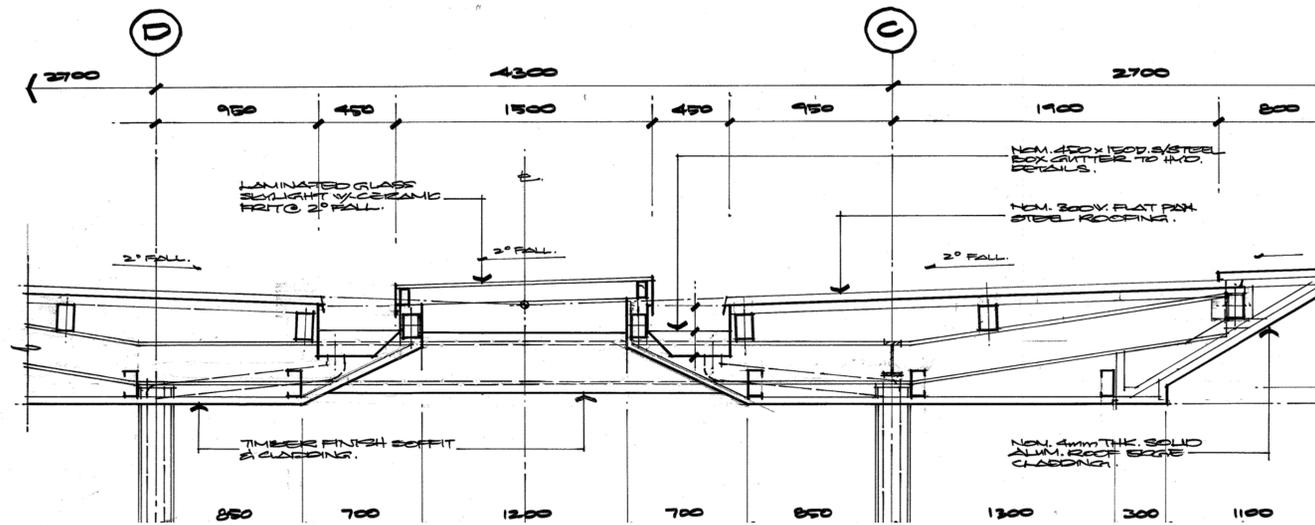
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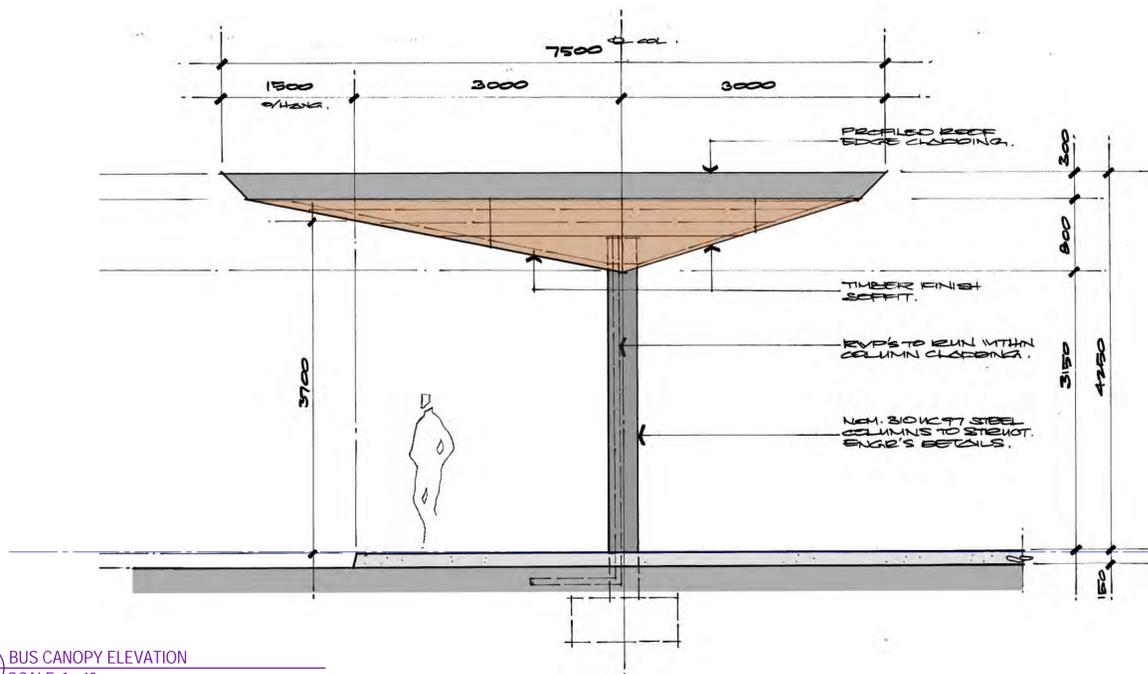


REFERENCES	SCALE	DESIGNED	LB
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	DATUM	CHECKED	CT
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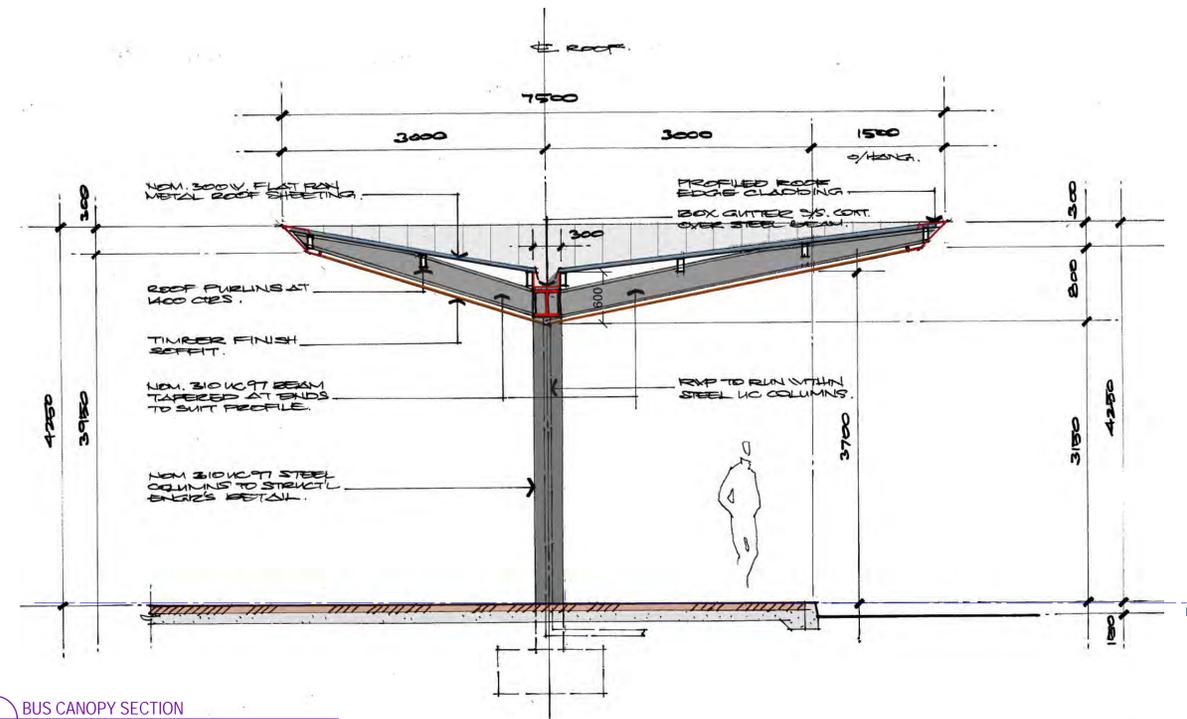
Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE	
OVERALL SECTIONS	
STATION SECTIONS - SHEET 01	
PTA Drawing No: 25-A-291-AR0103	Rev: A01



1 PLATFORM CANOPY SKYLIGHT DETAIL  
SCALE 1:20



2 BUS CANOPY ELEVATION  
SCALE 1:40



3 BUS CANOPY SECTION  
SCALE 1:40

PRELIMINARY ONLY  
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REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
A02	29/04/21	Issued for RD - IDC	LB	TA	CT	
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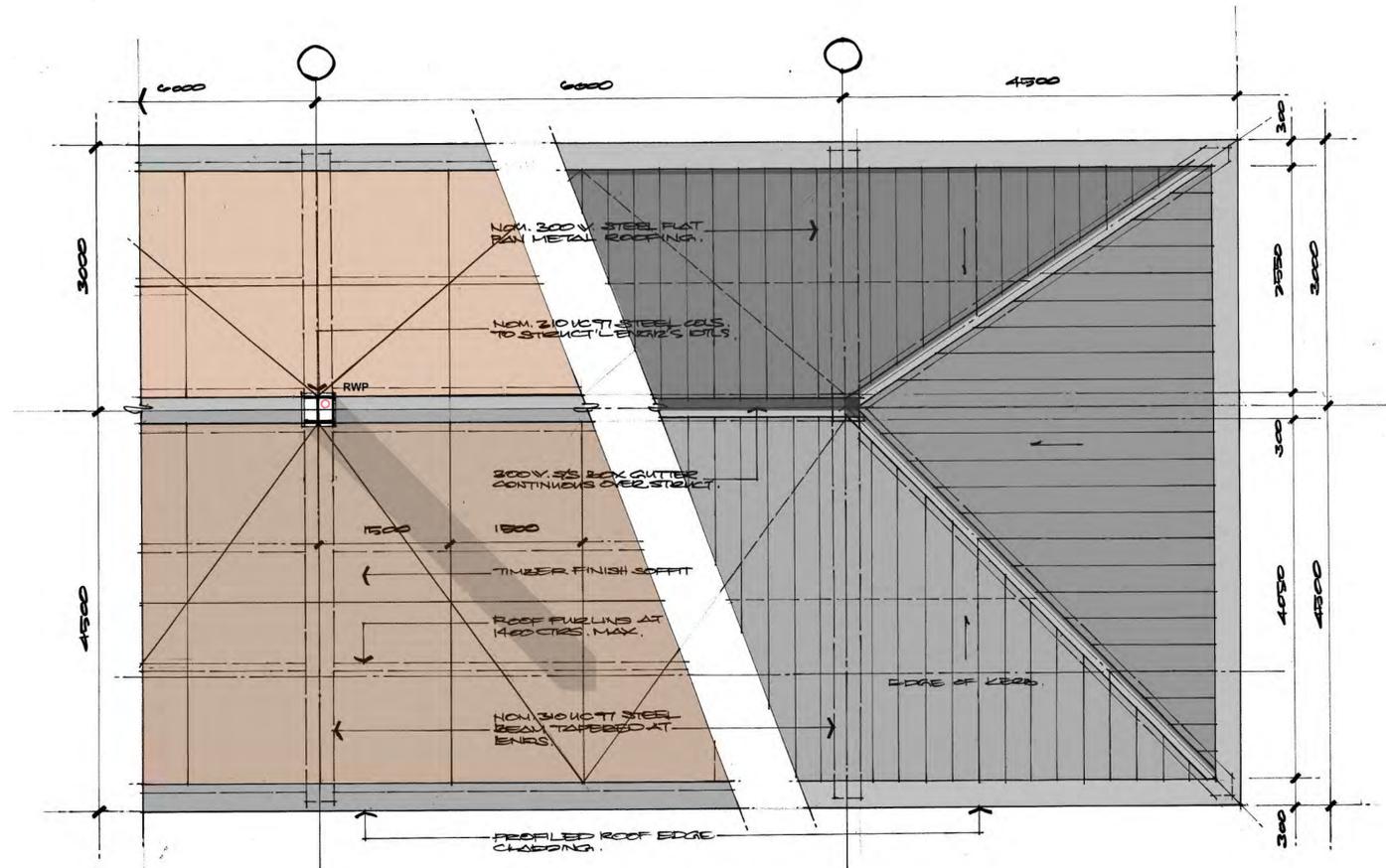
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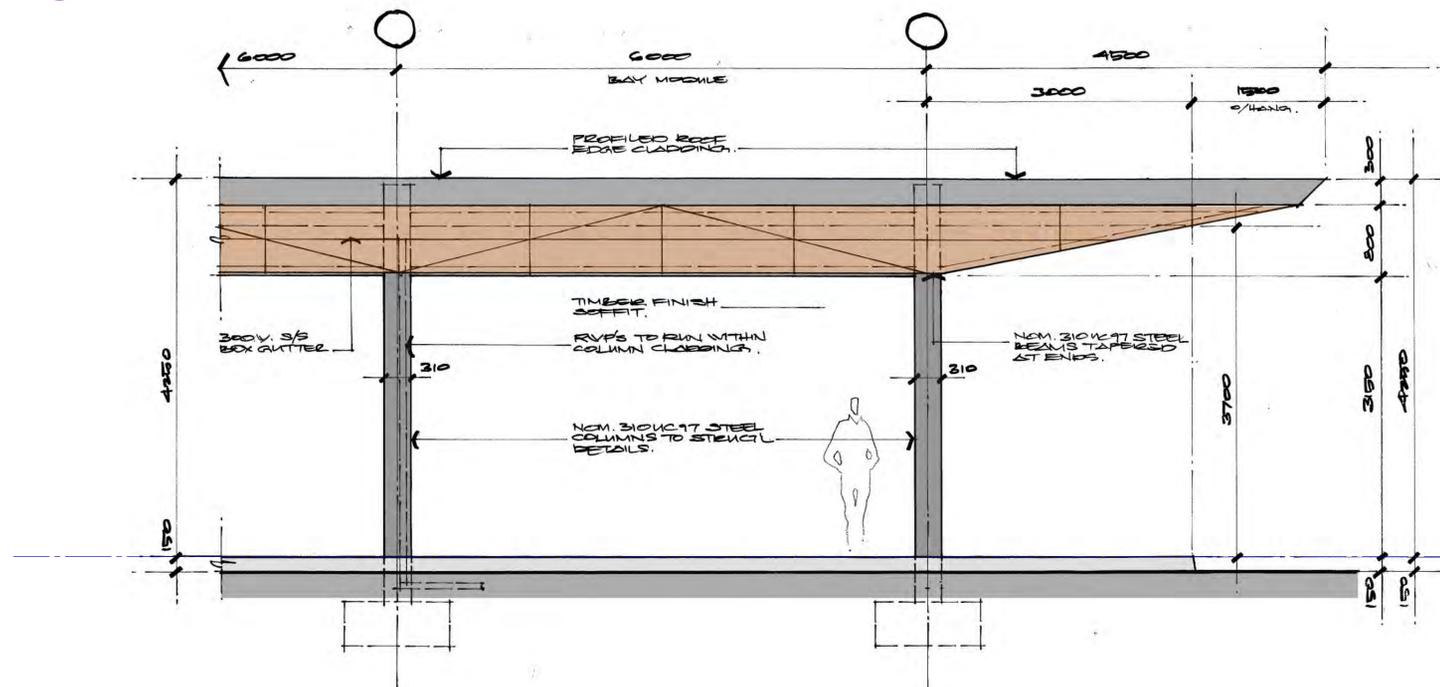


REFERENCES	SCALE	DESIGNED
	As indicated (@ A1)	L. BOUDOU
		DRAWN T. ALLAN
		CHECKED C. TESTA
		APPROVED M. MARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority		MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE		
DETAILS		
CANOPY DETAILS - SHEET 1		
PTA Drawing No: 25-A-291-AR0135		Rev: A



1 BUS CANOPY ROOF & CEILING PLAN



2 BUS CANOPY FRONT ELEVATION

RL 47100  
ELL - CONCOURSE 00

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REFERENCE DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	07/06/21	REFERENCE DESIGN	LB	TA	CT	MA
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ORIG SIZE	SCALE	AT ORIGINAL PLOT SIZE
A1	0 10 20 30 40 50 100mm	

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REFERENCES	SCALE	DESIGNED
	1 : 40 (@ A1)	L. BOUDOU
		DRAWN T. ALLAN
		CHECKED C. TESTA
		APPROVED M. ARAVIND
		DATE 07/06/21

Government of Western Australia Public Transport Authority		MORLEY ELLENBROOK LINE
ELLENBROOK STATION - ARCHITECTURE		
DETAILS		
CANOPY DETAILS - SHEET 2		
PTA Drawing No: 25-A-291-AR0136	Rev: A	

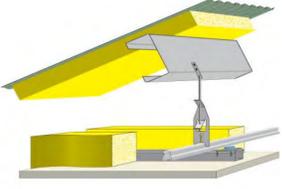
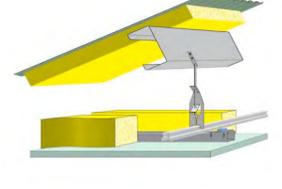
**DOC NO: MEL-MLCX-AR-SCH-00006** **14/06/2021**
**STATION: ELLENBROOK STATION** **REV - A**

CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
------	------	----------	-------------	-------	-------	------

**ACCESSORIES (AC)**

AC:01	Entrance matting	Concourse secure line gate: - All stations	Material: Heavy duty aluminium entrance mat with brush inserts Thickness: 17mm, with 20mm frame for recess mounting. Finish: Clear anodised Insert colour: TBC Fixing: Loose laid within floor recess Product: C/S Pediluxe or equivalent Manufacturer: C/S Group or equivalent Size: As per drawings		Attributes: - High load capacity, heavy duty construction - Recessed mounting - Wide range of inserts & colour options - Low Maintenance  Sustainability: - TBC	
AC:02	Accessible Grab Rail - Right / Left Hand	DDA Accessible Toilets - All stations	Manufacturer: Britex or equivalent Description: Vandal Resistant SS Backrest w 90deg RHS Grab Rail Set Model: BTX-BRC-R90_VR Size: 870x700 140 Deg Grab Rail Finish: Satin Stainless Steel			
AC:03	Accessible Grab Rail - Straight	DDA Accessible Toilets - All stations	Manufacturer: Britex or equivalent Description: 450mm SS Grab Rail Straight Concealed Model: BTR-01-038 Size: 450mm L Finish: Satin Stainless Steel			
AC:04	Ambulant Grab Rail - Right / Left Hand	Ambulant Toilets - All stations	Manufacturer: Britex or equivalent Description: SS 90deg Ambulant Grab Rail Model: BTR-01-058 Size: 450 x 450 Finish: Satin Stainless Steel			
AC:05	Toilet Roll Holder	All public and staff toilets - All stations	Manufacturer: Britex or equivalent Description: SS Jumbo Roll Toilet Tissue Dispenser Model: BTX-06-046 Size: 273 x 273 x 120 Finish: 304 Satin Stainless Steel			
AC:06	Clothes Hook	All staff toilets - All stations	Manufacturer: Britex or equivalent Description: SS Double Robe Hook Model: BTX-10-035 Size: 100 x 52 x 52 Finish: Satin Stainless Steel			
AC:07	Paper Towel Dispenser	All public and staff toilets - All stations	Manufacturer: Britex or equivalent Description: Recessed Paper Towel Dispenser w 19L Waste Receptacle Model: BTX-03-012 Size: 1397 x 333 x 115 Finish: Satin Stainless Steel			
AC:08	Shower Curtain Track	All shower areas: - All stations	Manufacturer: Argent or equivalent Description: Shower Curtain Track Aluminium Kit Model: RBA4177-1668 Size: Polished Steel Finish:			

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
AC:09	Soap Dish Holder	All shower areas: - All stations	Manufacturer: Britex or equivalent Description: Recessed HD Soap Dish SS Model: BTX-05-017 Size: 188 x 152 x 63 Finish: Satin Stainless Steel			
AC:10	DDA Shower Seat	All shower areas: - All stations	Manufacturer: Britex or equivalent Description: Accessible Folding Shower Seat with Support Legs Model: BTX-11-014 Size: 960 x 410 x 476 H. Finish: White Compact Laminate			
AC:11	Locker	Staff crib rooms: - All stations	Manufacturer: TBC Description: Model: Size: Finish:			
AC:12	Baby change table	Parenting Room - All stations	Manufacturer: Britex or equivalent Description: Stainless Steel Baby Change Tables Model: BTX-09-013 Recessed mounted Size: 940 x 590. Finish: Stainless steel with HDPE interior			
<b>CLADDING (CD)</b>						
CD:01	Vitreous Enamel Steel Cladding	Cladding to external façade: - Malaga - Morley - Noranda - Whiteman Park	Material: 1.5mm decarbonized steel sheet with vitreous enamel coating and 10mm calcium silicate backing panel. Thickness: TBC Finish: Vitreous enamel coating Fixing: Standard mechanical cassette fixing system to tophats (Studtek) & sarking behind Product: Ultramel or equivalent Manufacturer: BlueChip Group or equivalent Panel size: 2400 x 1150mm		Attributes: - Fire resistant, deemed non-combustible to AS1530.1 - High durability - anti-scratch, impact resistant - Low Maintenance due to high-lubricity of enamel coating - UV Stable - Graffiti resistant  Sustainability: - TBC	
CD:02	Compressed Fibre Cement Cladding - Façade	Cladding to internal façade of station accommodation: - Malaga - Morley - Noranda - Whiteman Park	Material: Compressed fibre cement board. Thickness: TBC Finish: Flush finish, painted Fixing: Direct fixing to wall studs with sarking membrane Product: ExoTec or equivalent Manufacturer: James Hardie or equivalent Panel size: 2400 x 1200mm			
CD:03	Vitreous Enamel Steel Cladding	Cladding to all steel structural columns: - All stations	Material: 1.5mm decarbonized steel sheet with vitreous enamel coating and 10mm calcium silicate backing panel. Thickness: TBC Finish: Vitreous enamel coating Fixing: Standard mechanical cassette fixing system to tophats (Studtek) & sarking behind Product: Ultramel or equivalent Manufacturer: BlueChip Group or equivalent Panel size: 2400 x 1150mm		Attributes: - Fire resistant, deemed non-combustible to AS1530.1 - High durability - anti-scratch, impact resistant - Low Maintenance due to high-lubricity of enamel coating - UV Stable - Graffiti resistant  Sustainability: - TBC	

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
CD:04	Plasterboard Cladding	Cladding to interior partitions to rooms within Accommodation building: - All stations	Material: Standard gypsum plasterboard Thickness: 13mm thk Finish: Flushed finish, painted PA:02 Fixing: Direct fixing to wall studs Product: Gyprock or equivalent Manufacturer: CSR or equivalent Panel size: 2400 x 1200mm			
CD:05	CFC Cladding - Internal	Cladding to interior walls and partitions requiring impact resistance: - All stations	Material: Compressed Fibre Cement board Thickness: 12mm thk Finish: Exposed joints, PU paint finish Fixing: Direct fixed to wall stud with sarking membrane Product: ExoTec or equivalent Manufacturer: James Hardie or equivalent Panel size: 2400 x 1200mm			
<b>CEILING &amp; SOFFITS (CL)</b>						
CL:01	Plasterboard ceiling	General ceilings to station accommodation: - All stations	Material: Standard gypsum plasterboard ceiling Thickness: 13mm thk Finish: Flushed finish, painted PA:02 Fixing: Rondo or similar furring channel suspension system Product: Gyprock or equivalent Manufacturer: CSR or equivalent Panel size: 2400 X 1200mm		Flush access panels where required.	
CL:02	Moisture Resistant Plasterboard ceiling	Ceilings to wet areas: - Public and Staff Bathrooms: - All stations	Material: Moisture resistant gypsum plasterboard ceiling Thickness: 13mm thk Finish: Flushed finish, painted PA:02 Fixing: Rondo or similar furring channel suspension system Product: Gyprock Aquachek or equivalent Manufacturer: CSR or equivalent Panel size: 2400 X 1200mm		Flush access panels where required.	
CL:03	Fire rated self-supporting ceiling system	Electrical and Services rooms: - All stations	Material: Fyrchek FR plasterboard FRL: FRL 120/120/120 from both sides Finish: Painted PA:02. Fixing: Fixed to 150 steel joists, as per system requirements Product: Gyprock Fyrchek or equivalent Manufacturer: CSR or equivalent Panel size: 2400 x 1200mm		Joints and gaps to be fully sealed with FR sealant to achieve required FRL.	
CL:04	Profiled Colorbond steel cladding	Ceiling below pedestrian bridge at entrance building: - Malaga - Noranda	Material: Ribbed steel sheet metal cladding with low fluted profile. Thickness: Nom. 0.42BMT, 4mm profile Finish: Colourbond coated, Colour: Basalt grey Fixing: Face fixed with Tek screws with washers to sub framing Product: Panel Rib or equivalent Manufacturer: Lysaght or equivalent Panel size: Custom L x 850mm W		Attributes: - Fire resistant, deemed non-combustible to AS1530.1 - Colorbond - high durability - Low maintenance - UV resistant  Sustainability: - Recyclable	



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006 14/06/2021

STATION: ELLENBROOK STATION REV - A

CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
CL:05	Fire rated suspended ceiling system	Ceiling to Store & Cleaners Rooms below Staircases: - All stations	Material: Fyrchek FR plasterboard FRL: FRL 120/120/120 from below Finish: Painted PA:02, if visible. Fixing: Fixed to furring channels, as per system requirements Product: Gyprock Fyrchek or equivalent Manufacturer: CSR or equivalent Panel size: 2400 x 1200mm		Joints and gaps to be fully sealed with FR sealant to achieve required FRL.	
CL:06	Timber-look Cladding	Soffits to Station roofs, Entrance buildings and bus canopies: - All stations	Material: Timber-look Cladding Thickness: TBC Finish: TBC Fixing: Standard fixing system to tophats & sarking behind Product: TBC Manufacturer: TBC Panel size: TBC			
CL:07	Suspended grid ceiling	To Staff rooms - All stations	Material: Mineral fibre ceiling panels Size: 1200 mm L x 300mm W x 19mm or similar Finish: Pre-finished smooth non-directional white finish Suspension: Suprafine XL grid Product: Ultima Plank - bevelled tegulr edge or equivalent Manufacturer: Armstrong Ceilings or equivalent			

CONCRETE ENGINEERING (CE) - FINISHES ONLY

CE:01	Prefabricated formwork concrete staircases	Concrete Staircases - All stations	Material: Cast insitu concrete staircase with permanent steel formwork Thickness: As per Manufacturer's requirements Finish: Painted and galvanized Tread: Tiled with stair nosings to AS1428.1 Product: Fast Tread or equivalent Manufacturer: FTI Group or equivalent Size: As per drawings		To comply with Luminance Contrast requirement of AS1428.1 for treads and risers.	
CE:02	Concrete Roof Slab	TBC				

DOORS (DR)

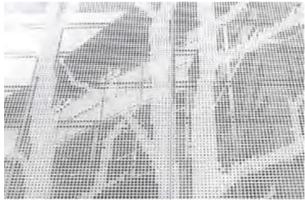
DR:01	Security roller grille	Concourse Secure Line Gate - All stations	Material: Steel roller grille shutter - heavy duty commercial for external applications Thickness: 16mm dia.x 1.2mm galv steel tubes sleeved with 20mm dia x 1.2mm aluminium tube at 90mm ctrs, linked with 3mm steel links at 208mm ctrs in brick pattern. Finish: Anodized aluminium Operation: Motorized or chain operated with overhead roller drum & guides Locking: Motor locked or shootbolt mechanism Product: Steel Roller Grille Manufacturer: Airport Doors or equivalent Size: Max. 8m W x 4.2m H		Attributes: - Heavy duty - Maximum vision and ventilation - Motorized operation  Sustainability: - recyclable	
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MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
DR:02	Single Doors - Non FR	Standard doors to operational rooms (non-Fire Rated): - All stations	Material: Flush panel solid-core timber doors FRL: n/a Thickness: TBC Frame: Aluminium door frames Finish: TBC Acoustics: To Acoustic requirements Locking: To Security requirements Product: Pyropanel non-FR doors or equivalent Manufacturer: Pyropanel or equivalent Size: As per drawings and AS1428.1 requirements		To comply with Luminance Contrast requirement of AS1428.1.	
DR:03	Single Doors - Glazed	Glazed door to CSO's: - All stations	Material: Steel frame door with full glazed panel. Glass: Clear Grade A safety glass with protective film to AS1288 & SWTC requirements Thickness: TBC Frame: Aluminium door frames Finish: TBC Acoustics: To Acoustic requirements Locking: To Security requirements Product: TBC Manufacturer: TBC Size: As per drawings and AS1428.1 requirements		To comply with Luminance Contrast requirement of AS1428.1.	
DR:04	Single Doors - FR	Fire rated doors to electrical & store rooms: - All stations	Material: Flush panel solid-core timber doors FRL: To suit wall FRL requirements Thickness: TBC Frame: Pressed steel door frames (FR) Finish: TBC Acoustics: To Acoustic requirements Locking: To Security requirements Product: Pyropanel FR doors or equivalent Manufacturer: Pyropanel or equivalent Size: As per drawings and AS1428.1 requirements		To comply with Luminance Contrast requirement of AS1428.1.	
DR:05	Louvered Doors	Louvered doors to mechanical rooms: - All stations	Material: Aluminium doors with louvered panels FRL: n/a Thickness: TBC Frame: Aluminium door frames Finish: TBC Acoustics: To Acoustic requirements Locking: To Security requirements Product: TBC Manufacturer: TBC Size: As per drawings and AS1428.1 requirements		To comply with Luminance Contrast requirement of AS1428.1.	
DR:06	Double Doors - Non FR	Standard doors to operational rooms (non-Fire Rated) - All stations	Material: Flush panel solid-core timber doors FRL: n/a Thickness: TBC Frame: Aluminium door frames Finish: TBC Acoustics: To Acoustic requirements Locking: To Security requirements Product: Pyropanel non-FR doors or equivalent Manufacturer: Pyropanel or equivalent Size: As per drawings and AS1428.1 requirements		To comply with Luminance Contrast requirement of AS1428.1.	

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STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
DR:07	Roller shutter with vision panels	Kiosks - All stations	Material: Fire rated interlocking steel slat roller shutter FRL: 2 hours FRL to Fire Engineer's requirements Thickness: 75mm H x 18mm D x 1.0mm thk roll-formed steel slats. Finish: Powder coated Steel Operation: Motorized with overhead roller drum & guides Locking: Motor locked or shootbolt mechanism Product: 2HR Fire Shutter Manufacturer: Airport Doors or equivalent Size: Max. 8.0m W x 5.0m H		Attributes: - Certified integrity for 2hr fire rated - Controlled descent mechanism  Sustainability: - Recyclable	
DR:08	Fire Hydrant Cabinet Doors	Concourse areas - All stations	Material: Flush panel solid-core timber or metal doors FRL: n/a Thickness: TBC Frame: Aluminium door frames Finish: TBC Acoustics: n/a Locking: To Security requirements Product: Pyropanel non-FR doors or equivalent Manufacturer: Pyropanel or equivalent Size: As per drawings and AS1428.1 requirements		DFES signage to be provided for ease of identification of Hydrant cabinets.	
<b>EQUIPMENT (EQ)</b>						
EQ:01	Lighting poles - Mid-hinge type	Platform level - All stations	Material: Mid-hinged (breakback) lighting poles in CHS or tapered octagonal profile to Electrical Engineer's specifications. Finish: Powder coated Locking: Tamper & vandal resistant fixings & locks. Product: Mid Hinged Poles & Columns Manufacturer: G&S Industries or equivalent Size: To Lighting & Electrical Engineer's requirements.			
EQ:02	Public telephone	Concourse unpaid zone: - All stations	Product: TBC Manufacturer: TBC Finish: Stainless steel Numbers: To PTA SWTC requirements		At least one accessible telephone shall be an accessible type as prescribed in AS1428.2 1992 Clause 30.1. The accessible telephone shall be fitted with volume control and an in-built hearing aid coupler and identified with the international symbol for deafness.	
EQ:03	Bike Racks	Bicycle storage racks - All stations	Material: Tow-tier bicycle racking system Finish: Powder coated Product: Easy-lift bicycle rack or equivalent Manufacturer: VelopA or equivalent Size: To suit bicycle numbers required			

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STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
EQ:04	Drink fountains	Concourse area: - All stations	Material: Stainless steel Finish: Satin 304 stainless steel finish Product: Dado Round Double Drinking Fountain Manufacturer: Britexor equivalent Size: 1000 x 490		Dual mounting heights. AS1428 Compliant.	
EQ:05	Hand dryers	Staff & UAT Toilets - all stations	Material: Stainless steel Finish: Linished No.4 finish Product: Airblade V Manufacturer: Dyson or equivalent Size: TBC			
<b>FLOOR COVERINGS (FC)</b>						
FC:01	Sheet vinyl flooring	Staff Crib / Transit Guard Booth - CSO: - All stations	Material: Slip resistant Vinyl sheets flooring with matching skirting. Finish: P4 / R11 Slip resistance, Anti-static to services rooms Product: Safeguard R12 or sim. equivalent. Manufacturer: Armstrong Flooring or equivalent Size: 2m x 20m x 2.00mm gauge sheet Colour: Slate		Vinyl flooring to suit specific area of use. To comply with DDA accessibility requirements.	
<b>FABRICATED METALWORK (FM)</b>						
FM:01	Perforated Vertical Screening with Artwork Graphic by Artist	Concourse edge screening & Entrance building: - Malaga - Noranda  Platform level screening: - Whiteman Park	Material: Perforated solid aluminium panel. Thickness: 3 - 4mm thick Finish: Anodized or Interpon D2525 powder coating Pattern: Graphic perforations (<5mm diameter for safety). Product: Pic Perf or equivalent Manufacturer: Locker Group or equivalent Size: 2440mm x 1220mm std Colour: TBC			
FM:02	Angled perforated vertical screening	Concourse level, including Entrance Building bridge screening: - Malaga - Noranda	Material: Perforated solid aluminium panel. Thickness: 3 - 4mm thick Finish: Anodized or Interpon D2525 powder coating Pattern: Standard perforations (<5mm diameter for safety). To be flat panels fixed to angled frames to create a 3D effect. Product: Perforated Manufacturer: Locker Group or equivalent Size: 2440mm x 1220mm std; full height of opening Colour: TBC			
FM:03	Metal Screening	Barriers that are located adjoining vertical drops - All stations	Material: Perforated solid aluminium panel. Thickness: 3 - 4mm thick Finish: Anodized or Interpon D2525 powder coating Pattern: Standard perforations (<5mm diameter for safety). Product: Perforated Manufacturer: Locker Group or equivalent Size: 2440mm x 1220mm std; 2400mm height Colour: TBC			

**DOC NO: MEL-MLCX-AR-SCH-00006** **14/06/2021**
**STATION: ELLENBROOK STATION** **REV - A**

CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
FM:04	Glass balustrades with stainless steel stanchions & LED handrails	Concourse voids, staircases and lift areas: - Malaga - Morley - Noranda - Whiteman Park	Material: Grade A clear laminated safety glass sealed to 900 H Grade 316 stainless steel plate stanchions at 1200 - 1500 ctrs. Thickness: Glass: TBC Stanchions: Nom. 8mm thk. Finish: No.4 /Linished /Hairline finish Protection: 3M Anti-Graffiti film AG-6 to inside face of glass. Handrail: Nom. 42 dia. stainless steel with LED lighting Product: Forrest range or equivalent Manufacturer: Lumorail or equivalent			
FM:05	Handrails - with LED lighting	DDA Accessible areas: - All stations	Material: Side mounted stainless steel handrails with LED lighting Fixing: Bracket mounted to walls, posts and screening frames. Size: Nom. 42mm dia. stainless steel circular rail Finish: Satin finish with 300mm section of yellow high visibility paint to ends. Product: Forrest range Manufacturer: Lumorail or equivalent			
FM:06	Security Fence - Anti-climbable	Alongside Platforms	Black anti-climbable security fence Promax 358 mesh - industry approved mesh with 71mm x 9mm spaced apertures makes climbing or cutting extremely difficult.			
FM:07	Weather protection glazed screens	Platforms, bust waiting areas - All stations	Material: Steel RHS framing with glazed screen infill Glass: GL:03 Size: As per drawings Finish: Linished No.4 Product: Custom			

**FIRE PROTECTION (FP)**

FP:01	Fire Protection - Structural Steelwork	Structural steelwork - All stations	Material: Vermiculite Gypsum Based wet mix spray or Intumescent Paint Thickness: To meet required FRL Finish: n/a Product: CAFCO or equivalent, to Structural Engineer's specifications Promat or equivalent Manufacturer:			
FP:02	Fire collars	Penetrations through suspended slabs: - Morley - Malaga - Noranda - Whiteman Park	Material: Penetration Seals for Pipes FRL: As per floor FRL requirements Product: Promaseal Retrofit Collar or equivalent Manufacturer: PROMAT or equivalent			

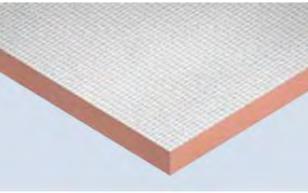
**GLAZING (GL)**

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STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
GL:01	Laminated Safety Glass - Glazed Windows and Doors	CSO, Offices and Rooms: - All stations	Material: Clear laminated Grade A safety glass Thickness: Nom. 17.52thk. TBC by Structural Engineer & to AS1288. Colour: Clear Framing: Aluminium - anodized Fixing: Gasket or sealant within glazing pockets ESD: All Glazed Elements SHGC: 0.80 to ESD requirements. Product: Laminated safety glass Glass Manufacturer: Cooling Brothers or equivalent Panel size: Nom. 1200 - 1500mm W. Protection: 3M Anti-Graffiti film AG-6 to public face of glass.		All glass protected from graffiti by using an anti-graffiti film of 0.6mm, applied on the side that is prone to public reach.	
GL:02	Fritted Laminated Safety Glass - Skylights	Station and Platform roof skylights - All stations	Material: Clear laminated Grade A safety glass Thickness: Nom. 17.52thk. TBC by Structural Engineer & to AS1288 for trafficability. Colour: Clear with 75% solid white dot-matrix ceramic frit pattern. Framing: Aluminium - anodized Fixing: Gasket or structural silicone sealant. ESD: All Glazed Elements to ESD and NCC Section J requirements. Product: Laminated safety glass Glass Manufacturer: Cooling Brothers or equivalent Panel size: Nom. 1200 - 1500mm W.			
GL:03	Laminated Safety Glass - Glazed Screens	Protective glass shelters & screens - All platforms Concourse edge - Malaga - Morley	Material: Clear laminated Grade A safety glass Thickness: Nom. 17.52thk. TBC by Structural Engineer & to AS1288. Colour: Clear Framing: Aluminium - anodized Fixing: Gasket or sealant within glazing pockets ESD: n/a Product: Laminated safety glass Glass Manufacturer: Cooling Brothers or equivalent Panel size: Nom. 1200-1500mm W. x 2400mmH Protection: 3M Anti-Graffiti film AG-6 to public face of glass.			
GL:04	Laminated safety Glass - Lift Enclosure	Glass lifts - Morley - Malaga - Noranda - Whiteman Park	Material: Clear laminated Grade A safety glass Thickness: Nom. 17.52thk. TBC by Structural Engineer & to AS1288. Colour: Clear Framing: Stainless steel - Linished No.4 finish Fixing: Gasket or sealant within glazing pockets ESD: All Glazed Elements SHGC: 0.80 to ESD requirements. Product: Laminated safety glass Glass Manufacturer: Cooling Brothers or equivalent Panel size: Nom. 1200 - 1500mm W. Protection: 3M Anti-Graffiti film AG-6 to public face of glass.			

**INSULATION (IN)**

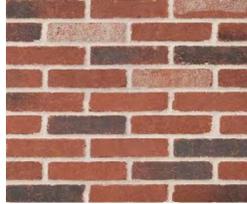


MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
IN:01	Roof thermal insulation	Station & Accommodation roofs: - All stations	Material: Rockwool Anticon insulation with HD Thermofoil or equivalent Thickness: Nom. 60mm, TBC by ESD Engineer Fixing: With Safebridge HP roof insulation system on mesh ESD: R-Value TBC by ESD Engineer Product: Bradford or equivalent Manufacturer: CSR or equivalent			
IN:02	Bulk Ceiling insulation	Ceilings: - All stations	Material: Rockwool Anticon insulation with HD Thermofoil or equivalent Thickness: Nom. 60mm, TBC by ESD Engineer Fixing: With Safebridge HP roof insulation system on mesh ESD: R-Value TBC by ESD Engineer Acoustics: Rw TBC by Acoustic Engineer Product: Bradford or equivalent Manufacturer: CSR or equivalent			
IN:03	Wall and partition insulation	Accommodation building: - All stations	Material: Rockwool Acoustigard insulation 11kg or equivalent Thickness: Nom. 75 thk - TBC by ESD Engineer Fixing: Laid within drywall partition between studs ESD: R-Value TBC by ESD Engineer Acoustics: Rw TBC by Acoustic Engineer Product: Bradford or equivalent Manufacturer: CSR or equivalent			
IN:04	Rigid Under slab Insulation	Elevated Concourse - Malaga - Morley - Noranda - Whiteman Park	Material: Kooltherm K10 FM rigid insulation board w foil face or equivalent Thickness: Nom. 75 thk - TBC by ESD Engineer Fixing: Mushroom head fixing pins to underside of slab ESD: R-Value TBC by ESD Engineer Acoustics: n/a Product: Kooltherm K10 FM Soffit Board or equivalent Manufacturer: Kingspan or equivalent			
<b>LOUVRES (LV)</b>						
LV:01	Ventilation Louvers - Rain Defence	Mechanical rooms, electrical rooms, etc: - All stations	Material: Two stage aluminium louvers within aluminium framing Finish: Aluminium, anodized Product: RSH-5700 Storm Resistant Louvre with 50mm blade pitch. Louvre performance TBC to Mechanical Engr's requirements Manufacturer: CS Louvers or equivalent Size: 1200mm W panels, as per drawing			



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

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CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
LV:01	Ventilation Louvers - Non rain defence	Protected mechanical rooms - All stations	Material: Single stage aluminium louvers within aluminium framing Finish: Aluminium, anodized Product: Louvre with 50mm blade pitch. Louvre performance TBC to Mechanical Engr's requirements Manufacturer: CS Louvers or equivalent Size: 1200mm W panels, as per drawing			
<b>MASONRY (MA)</b>						
MA:01a	Brick Wall	Entrance building - Noranda Station - Whiteman Park  Service Building - Ellenbrook Station	Material: Clay face brick commons Finish: Smooth face Mortar: Class M3 and M4, Concave mortar joints Colour: Estilo Nero Azul (Dark Charcoal). Product: Spanish Collection or equivalent Manufacturer: Midland Brick or equivalent Size: 230mm x 110mm x 76mm Protection: Clear anti-graffiti coating			
MA:01b	Brick Wall	Accommodation buildings - Ellenbrook Station  Ancillary buildings - linewide precincts	Material: Clay face brick commons Finish: Smooth face Mortar: Class M3 and M4, Concave mortar joints Colour: Restoration Red Coach or equivalent Product: Midland Reds or equivalent Manufacturer: Midland Brick or equivalent Size: 230mm x 110mm x 76mm Protection: Clear anti-graffiti coating			
<b>METALWORK (MW)</b>						
MW:01	Wire Mesh Barrier	High level of secure line gate - All stations	Material: Stainless steel cable net with sleeves Thickness: Nom. 1.5mm dia. mesh with 40-60mm aperture Finish: Grade 316L stainless steel Product: Jakob INOX Line Webnet N2 or equivalent Manufacturer: Jakob Rope Systems or equivalent			
MW:02	Screening / Fencing	Rail Corridor - All stations	Material: PTA standard rail fencing Thickness: Finish: Product: Manufacturer:			
MW:03	Surface Drains		To Hydraulic Engineer's selection			

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STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
MW:04	Bench Seating	Platform seating - All stations and precinct	Material: Stainless Steel Seats as Per PTA standard design Thickness: Finish: Product: Manufacturer:			Seats located in positions where the arrival of services can be observed, without affecting the general flow of pedestrians. Seats should not allow visitors access to higher levels (i.e. adjoining stair voids) If the perforated sheeting is to be used as a seat base there should be no low level framing to the front or rear of the unit (cleaning access). Materiality: Stainless-steel
MW:05	Bins	Precinct, platform and concourse levels - All stations	Material: Stainless Steel Bins as Per PTA standard design Thickness: Finish: Product: Manufacturer:			The bin lid is locked in place to prevent removal of the liner. Materiality: Perforated, stainless steel outer and liner
MW:06	Service/ Refuge zones	Refuge zone railings - All stations	Material: Steel - hot dip galvanised safety fence Thickness: Finish: Product: Manufacturer:			
MW:07	Steel staircase and railing	Platform level - All stations	Material: Mild steel - hot dip galvanised stair, grating and balustrade Thickness: Nom 40 dia. rail Finish: Hot dipped galvanized finish Product: Access Products or equivalent Manufacturer: Webforge or equivalent			
MW:08	Concourse Level - All Stations		Refer Windows WD:01			
MW:09	Tactile Ground Surface Indicators - Stainless steel		N/A			
MW:10	Safety Stair nosing	Concourse & Entrance Building Staircases - Malaga - Morley - Noranda - Whiteman Park	Material: Aluminium ribbed safety stair nosing Size: 50mm Finish: Anodized, with 4 carborundum strips and safety yellow strip, R13 anti-slip rating. Product: ProStep 5 or equivalent Manufacturer: CTA Australia or equivalent		In compliance with Luminance Contrast requirement of AS1428.1.	
MW:11	Stainless steel mirror	Public toilets: - All stations	Material: Anti-vandal Polished stainless steel mirror Size: 1000 x 450, Finish: High-polished No. 8 mirror finish Product: Security Stainless Mirror or equivalent Anti-Vandal, anti-ligature, Disabled Compliant Manufacturer: Britex -SMIR or equivalent			



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

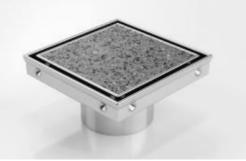
DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
MW:12	Bollards - Galvanized Steel	PSP, Kiss-and-Ride, etc - All stations & precincts	Material: Concrete filled HDG Steel CHS with domed cap Size: 168mm dia x 800H Finish: White/red/white Reflective Tape to top Colour: Natural galvanized finish Product: Pit Bull bollard or equivalent Manufacturer: Barrier Group or equivalent			
MW:12	Bollards - Stainless Steel	Station entry forecourt - All stations	Material: Stainless steel bollard, Grade 316L Size: 168mm dia x 800H Finish: White/red/white Reflective Tape to top Colour: Linished No.4 finish Product: 316 Stainless Steel Round Bollards or equivalent Manufacturer: Barrier Group or equivalent			
<b>PAINT (PA)</b>						
PA:01	Paint to Metalwork	All stations and bus interchanges	Type: Dulux high performance paint Product: Weathermax HBR or equivalent Manufacturer: Dulux or equivalent Colour: Black			
PA:02	Paint to Plasterboard Ceilings	All stations	Type: Flat acrylic to plasterboard ceilings & bulkheads Product: Dulux Porter's Ceiling Flat or equivalent Manufacturer: Dulux or equivalent Colour: White			
PA:03	Anti Graffiti Coating	All stations	Type: Anti graffiti coating Product: SurfaceShield HD Clear or equivalent Manufacturer: Dulux or equivalent Colour: TBC			
PA:04	Paint to Interior Walls	All stations	Type: Low Sheen acrylic to plasterboard Product: Dulux Wash and Wear Low Sheen or equivalent Manufacturer: Dulux or equivalent Colour: TBC			
PA:05	Paint to Exterior Walls	All stations	Type: TBC Product: TBC Manufacturer: Dulux or equivalent Colour: TBC			
PA:06	Paint to Concrete	All stations	Type: TBC Product: TBC Manufacturer: Dulux or equivalent Colour: TBC			
PA:07	Contrasting colour finish	All stations	Type: TBC Product: TBC Manufacturer: Dulux or equivalent Colour: TBC			
PA:08	Bike Shelter paint	All stations	Type: TBC Product: TBC Manufacturer: Dulux or equivalent Colour: TBC			



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

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STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
PA:09	Paint to Plasterboard Ceilings - Wet Areas	All stations	Type: Flat acrylic to plasterboard ceilings & bulkheads Product: Dulux Porter's Ceiling Flat or equivalent Manufacturer: Dulux or equivalent Colour: White			
<b>PARTITIONS &amp; DRYWALLING (PD)</b>						
PD:01	Standard partition	Accommodation building - All stations	Material: 2x13mm Plasterboard lining both sides on 76 stud Height: Full height / Ceiling Height Product: Gyprock or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:02	Lining	Accommodation building - All stations	Material: 2x13mm Plasterboard lining one side only (risers/ducts) Height: Full height / Ceiling Height Product: Gyprock or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:03	Fire rated partition - FRL120/120/120 both sides	Accommodation building - All stations	Material: 2x16mm Fyrchek lining both sides on 76 stud FRL: FRL 120/120/120 Height: Full height Product: Fyrchek / MR Fyrchek or equivalent (MR where abutting Wet Areas) Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:04	Fire rated lining - FRL120/120/120 one side - Full height	Accommodation building - All stations	Material: 3x16mm Fyrchek lining on 76 stud (risers/ducts/enclosed rooms) FRL: FRL 120/120/120 from one side only Height: Full height lining Product: Fyrchek or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:05	Fire rated partition - FRL-/90/90 both sides - Full height	Accommodation building - All stations	Material: 16mm Fyrchek both sides on 76 stud (kiosk) FRL: FRL -/90/90 Height: Full height Product: Fyrchek or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:06	Fire rated lining - FRL-/90/90 one side - Full height	Accommodation building - All stations	Material: 3x13mm Fyrchek on 76 stud (kiosk at external wall) FRL: FRL -/90/90 from one side only, Height: Full height lining Product: Fyrchek or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:07	Glazed partition	Lift Enclosure	Material: Framed glazed partitions fixed to lift steel enclosure, with stainless steel trims Glass: GL:04			

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
PD:08	Brick Veneer Wall	Accommodation building - Ellenbrook	Material: 110 Face brick w 2x13mm Plasterboard lining on one side of 76 studs Height: Full height Product: Gyprock or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
PD:09	Fire rated Brick Veneer Wall - FRL-/90/90	Accommodation building - Ellenbrook	Material: 110 Face brick with 2x13mm Fyrchek lining on one side of 76 studs FRL: FRL -/90/90 Height: Full height Product: Fyrchek or equivalent Manufacturer: CSR or equivalent Finish: Flushed and painted PA:XX			
<b>PLUMBING SERVICES FIXTURES (PF)</b>						
PF:01	Toilet Suite	Public Toilets - All stations	Manufacturer: Britex or equivalent Type: Wall Mounted toilet suite Model: PWM or equivalent Size: 515mm x 350mm Finish: 304 Satin Stainless Finish		4Star WELS rating & Watermark Certified. Concealed cistern Automatic flush sensor Ultra Vandal resistant	
PF:02	Vanity Basin	Public Toilets - All stations	Manufacturer: Britex or equivalent Type: Wall Mounted Hand Basin or equivalent Model: HBS or equivalent Size: 500mm x 425mm Finish: 304 Satin Stainless Finish		Vandal resistant	
PF:03	Vanity Basin Mixer	Public Toilets - All stations	Manufacturer: Britex or equivalent Type: Eco TIMED Flow Pillar Tap Model: TW-9101 or equivalent Size: 500mm x 425mm Finish: Stainless Finish	 TW-9101 Eco Timed Flow Pillar Tap	Vandal resistant	
PF:04	Toilet Suite	Staff Toilets - All stations	Manufacturer: Argent or equivalent Type: Vista Hygienic Flush Wall Hung Toilet Model: 8991001S4B or equivalent Size: 540mm x 370mm Finish: White ceramic			
PF:05	Vanity Basin	Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: 850 Ceramic Furniture Wash Basin 0 One Tap Hole Model: BSW-FWB850-1 or equivalent Size: 850mm x 480mm Finish: White Ceramic			
PF:06	Vanity Basin Mixer	Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Hob Mounted Mixer Tap - Fixed Spout Model: TW-MIX-01 or equivalent Size: n/a Finish: Bright Chrome			

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
PF:07	UAT Toilet Suite	UAT & UAT Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Accessible Toilet Suite Model: PTSD or equivalent Size: 800mm x 355mm Finish: 304 Satin Stainless Finish		4Star WELS rating & Watermark Certified. Ultra Vandal resistant AS1428 Compliant Automatic flush sensor	
PF:08	UAT Basin	UAT & UAT Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Accessible Bellagio Basin w Integrated Side Shelf or equivalent Model: HBBEL-DS or equivalent Size: 500mm x 425mm Finish: 304 Satin Stainless Finish		Vandal resistant	
PF:09	UAT Basin Mixer	UAT & UAT Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Eco Timed Flow Pillar Tap Model: TW-9101 or equivalent Size: 500mm x 425mm Finish: Stainless Finish	 TW-9101 Eco Timed Flow Pillar Tap	Vandal resistant	
PF:10	UAT Shower Mixer	UAT & UAT Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Accessible Lever Activated Shower Mixer Model: TW-MIX-22 or equivalent Size: with 150mm accessible handle Finish: Bright Chrome		Vandal resistant	
PF:11	Urinals	Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Ceramic Wall Mounted Urinal Pod Model: BSW-UP or equivalent Size: 270mm x 340mm Finish: White ceramic			
PF:12	UAT Shower Rail & Hand Shower	UAT & UAT Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Adjustable Height Hand Held Shower Set w Grab Rail Model: BTR-01-062 or equivalent Size: 500mm x 425mm Finish: Stainless Steel			
PF:13	Floor Waste - General	All wet areas & showers - All stations	Manufacturer: Storm Tech or equivalent Type: Tile Insert Drain Model: SQ100Ti20-80 or equivalent Size: 130 x 130 Finish: Stainless Steel			
PF:14	Ambulant Toilet	Public & Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Centurion Ambulant Pan Model: PCAM or equivalent Size: 650mm x 355mm Finish: 304 Satin Stainless Finish		4Star WELS rating & Watermark Certified. Vandal resistant AS1428 Compliant Automatic flush sensor	

**DOC NO: MEL-MLCX-AR-SCH-00006** **14/06/2021**
**STATION: ELLENBROOK STATION** **REV - A**

CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
PF:15	Urinals	Male Public & Staff Toilets - All stations	Manufacturer: Britex or equivalent Type: Barren Waterless Urinal Model: UBW or equivalent Size: 360mm x 395mm Finish: 304 Satin Stainless Finish		Fully waterless urinal (no water connection) Vandal resistant	
PF:16	Kitchen Sink	Staff Crib / Tea Prep - All stations	Manufacturer: Britex or equivalent Type: Café Sink Model: CAFE or equivalent Size: 360mm x 395mm Finish: 304 Satin Stainless Finish			
PF:17	Kitchen Mixer	Staff Crib / Tea Prep - All stations	Manufacturer: Britex or equivalent Type: Hob Mounted Mixer Tap - Swivel Spout Model: TW-MIX-02 or equivalent Size: n/a Finish: Bright Chrome			
PF:18	Cleaner's trough	Cleaner's Room - All stations	Manufacturer: Britex or equivalent Type: Floor Mounted Cleaner's Sink Model: CSF or equivalent Size: 600mm x 590mm Finish: 316 Stainless Finish		With sand filter	

**PAVING (PV)**

PV:01	Clay pavers	Platform level - All stations	Material: Solid clay segmented paver in Herringbone configuration. Size: 230 x 114 x 60 .Finish: Finish: Kiln 9 (grain to run length of face). No sealer. Product: Heavy Duty 60 or equivalent Manufacturer: Midland Brick or equivalent Colour: Red trafficable type Lay on 1:6 cement/sand screed. Slip rating: Slip resistant CoF >0.4 wet.		1:100 minimum cross fall away from track	
PV:02	Safety Tactile TGSi Pavers - platform edge	Platform level - All stations	Material: Warning Integrated TGSi concrete paver Size: 400 x 400 x 60 and 300 x 300 x 60 (bus stands) Finish: Tactile ground surface indicators Product: TBC Manufacturer: TBC Colour: Yellow/ Black/ Grey/ Red Slip rating: Non-slip, P5 rating to AS3661.1		To comply with Luminance Contrast requirement of AS1428.1.	
PV:03	Safety Yellow Edge Paving platform edge conditions	Platform level - All stations	Material: Engineered high strength concrete paver Size: 400 x 100 x 60 Finish: Non-slip Product: TBC Manufacturer: TBC Colour: Yellow Slip rating: Non-slip, P5 rating to AS3661.1		To comply with Luminance Contrast requirement of AS1428.1.	

**ROOFING (RO)**

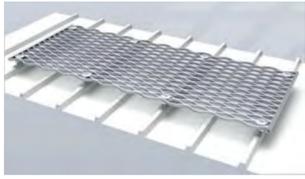
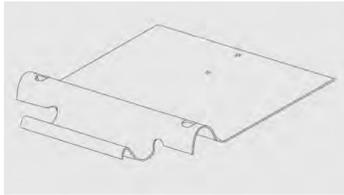
DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
RO:01	Roof sheeting - Flat Pan	Main Station Roof & Bus Area canopies: - All stations	Material: Roof sheeting Size: TBC Fixing: TBC Finish: Colorbond Colour: Nom. Basalt Product: TBC Manufacturer: TBC Insulation: TBC		All flashing and cappings to match roofing colour.	
RO:02	Profiled aluminium roof edge cladding	Main Station Roof & Bus Area canopies: - All stations	Material: Precoated solid aluminium cladding Thickness: 3mm thk Fixing: Mechanical cassette fixing to tophats on sub framing Finish: TBC Colour: To match roof sheeting Product: Mondoclad or equivalent Manufacturer: HVG Facades or equivalent Insulation: n/a			
RO:03	Gutters	Main Station Roof & Bus Area canopies: - All stations	Material: Marine grade Aluminium Size: To Hydraulic Engineer's requirements Thickness: TBC Fixing: Supported on metal gutter boards and straps, with allowance for trafficability. Finish: Powdercoated Insulation: Anti drumming membrane			
RO:04	Rainwater Downpipe Shrouds	Where exposed/ not able to be concealed within cladding	Material: TBC Thickness: TBC Finish: TBC			
RO:05	Roof sheeting - Standard	Accommodation roof - All stations	Material: Profiled steel roof sheeting Size: Nom. 700mm wide, 0.48-0.55BMT Fixing: Concealed clip fixings, trafficable Finish: Colorbond Colour: Surfmist Product: Klip-Lok 700 Hi-Strength or equivalent Manufacturer: Lysaght or equivalent Insulation: Refer to Insulation section, IN:XX With Safebridge HP roof insulation system on mesh		All flashing and cappings to match roofing colour.	
<b>SAFETY &amp; ACCESS SYSTEM (SA)</b>						
SA:01	Static line System  (Previously Stairs & Ramps)	High level accessible areas for maintenance to Roofs, canopies; - All stations	Type: Static Line system to Specialist's design Fixing: To all Standards and Code requirements Finish: Powder coated Colour: To match roof colour. Product: X-clerate Horizontal Static Line or equivalent Manufacturer: SafeMaster or equivalent			



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006 14/06/2021

STATION: ELLENBROOK STATION REV - A

CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
SA:02	Roof access walkway	High level accessible areas for maintenance to Roofs, canopies; - All stations	Type: Aluminium access walkway grating Size: 600mm W Fixing: To all Standards and Code requirements Finish: Powder coated Colour: To match roof colour. Product: Slipnot or equivalent Manufacturer: SafeMaster or equivalent			
SA:03	Ladder Hook	High level accessible areas for maintenance to Roofs, canopies; - All stations	Type: Aluminium access walkway grating Size: TBC Fixing: To all Standards and Code requirements Finish: Powder coated Colour: To match roof colour. Product: Ladder Brackets Manufacturer: SafeMaster or equivalent			

STEEL ENGINEERING (SE) - FINISHES ONLY

SE:01	Structural Steel - Non-visible	Concealed structural steelwork - non visible to public & staff areas - All stations	Material: Protective finish of structural steel to Structural Engineer's specifications.			
SE:02	Exposed structural & secondary steel - Semi visible	Structural & secondary steel - visible to staff areas - All stations	Material: Protective finish of structural steel to Structural Engineer's specifications. Finish: To be primed and painted, PA:XX			
SE:03	Structural Steel Columns	All structural steel columns - All station buildings	Material: Protective finish of structural steel to Structural Engineer's specifications. Finish: TBC			

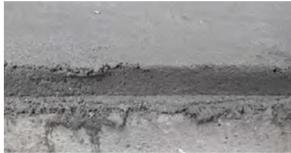
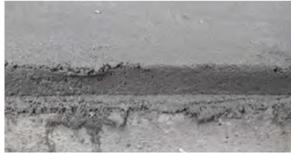
SIGNAGE & GRAPHICS (SN)

SN:xx	Station Signage	All PTA Station Signage - All stations & precinct	REFER TO PTA SIGNAGE GUIDE			
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TILING (TL)

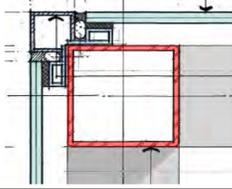


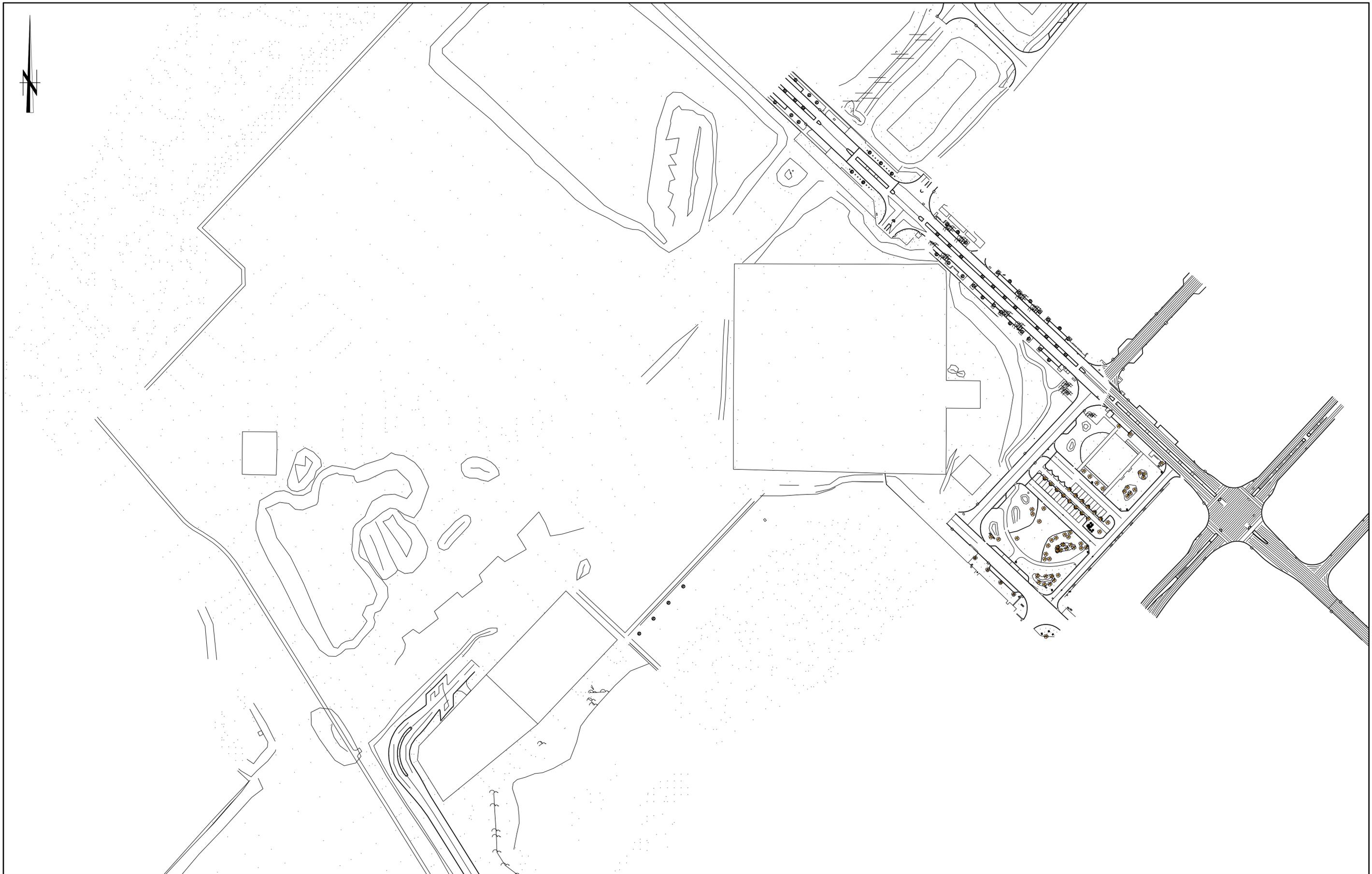
MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
TL:01	Vitrified tiles.	All stations - Concourse level - Fully enclosed areas (Refer PV:04 for Open Areas)	Material: Vitrified tiles. Size: TBC Finish: Charcoal epoxy grout Product: Granito 'Optima' Eureka 'Boulevard' or equivalent Manufacturer: Granito or equivalent Colours: Light grey, Steel grey, Black, Alabaster, Charcoal. Slip rating: R12			
TL:02	Vitrified tile floor finish	Public and Staff Bathrooms - all stations	Material: non-slip vitrified tiles. Size: 200x200 Finish: Charcoal epoxy grout Product: Granito: 'Optima' or equivalent Manufacturer: Granito or equivalent Colour: Light Grey, Steel Grey, Black Slip rating: R12		Of dark grout to minimise any residual impact of graffiti of suitable coefficient to prevent slip hazards when wet	
TL:03	Vitrified tile wall finish	Public and Staff Bathrooms - all stations	Material: Ceramic tiles Size: 200x200 mm Finish: Gloss finish to Staff bathrooms only. Charcoal epoxy grout. Tiles should be butt jointed and cover strips of stainless steel should be added to external angles. Product: TBC Manufacturer: TBC Colours: ultra-white plain, Ultra-white ripple Slip rating: R12		Full height from floor to ceiling (including cubicles) in public bathrooms. Floor height to minimum 2700mm in Staff bathrooms	
<b>TOPPING &amp; SCREEDS (TP)</b>						
TP:01	Screed to Slab	Concourse floor slab - All stations	Material: Sand cement screed - premixed Application: To manufacturer's requirements, provide reinforcement mesh of screeds over 40mm thk. Product: Ardex A36 Abascreed or equivalent Manufacturer: ARDEX Australia or equivalent			
TP:02	Screed to Toilets	Toilets and Wet Areas - All stations	Material: Rapid Set Screed Cement Application: To manufacturer's requirements, provide reinforcement mesh of screeds over 40mm thk. Product: Ardex A38 or equivalent Manufacturer: ARDEX Australia or equivalent			
<b>TRIM (TR)</b>						
TR:01	Skirtings	Accommodation building - CSO, Staff Crib, etc - All stations	Material: Stainless steel skirting Size: 150mm H Finish: Linished No. 4 finish, flush with wall lining. Product: TBC Manufacturer: TBC		Skirting material shall resist the following, without noticeable change in surface appearance: i. vandalism; ii. heavy impacts; and iii. abrasion from cleaning methods and maintenance systems. The materials and finishes for skirting in public areas shall be selected from the following range: 316 stainless steel; and / or Material to match floor finish.	



MORLEY ELLENBROOK LINE (MEL) - STATION & PRECINCT - ARCHITECTURAL MASTER MATERIALS SCHEDULE

DOC NO: MEL-MLCX-AR-SCH-00006						14/06/2021
STATION: ELLENBROOK STATION						REV - A
CODE	ITEM	LOCATION	DESCRIPTION	IMAGE	NOTES	SWTC
TR:02	Lift Enclosure - Corner & Door Trims	DDA Lifts - Malaga - Morley - Noranda - Whiteman Park	Material: Stainless steel corner & door trims Size: To lift details Finish: Linished No. 4 finish, flush with glazing. Product: TBC Manufacturer: TBC			
<b>WINDOWS (WD)</b>						
WD:01	Windows	Station accommodation building - All stations	Material: Extruded aluminium framing Size: As per drawings Finish: Anodized finish Colour: TBC Glass: Clear laminated glass, GL:01 Product: 419 SG Flushline system (Single Glazed) or equivalent Manufacturer: Capral or equivalent ESD: In compliance with ESD Engineer's requirements for NCC Section J 2019.			
<b>WATERPROOFING (WP)</b>						
WP:01	To external floor slab	Elevated Concourse - Malaga - Morley - Noranda - Whiteman Park	Material: Liquid Applied Water Based Epoxy Membrane Finish: Undertile to external areas Product: WPM300 (HydrEpoxy 300) or equivalent Manufacturer: ARDEX Australia or equivalent			
WP:02	To wet areas	Toilets, showers, Changerooms - All stations	Material: Liquid applied Undertile PU Acrylic Hybrid Membrane Finish: Under tile to Wet Areas Product: WPM155 Rapid or equivalent Manufacturer: ARDEX Australia or equivalent			



REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A1						

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REFERENCES

SCALE
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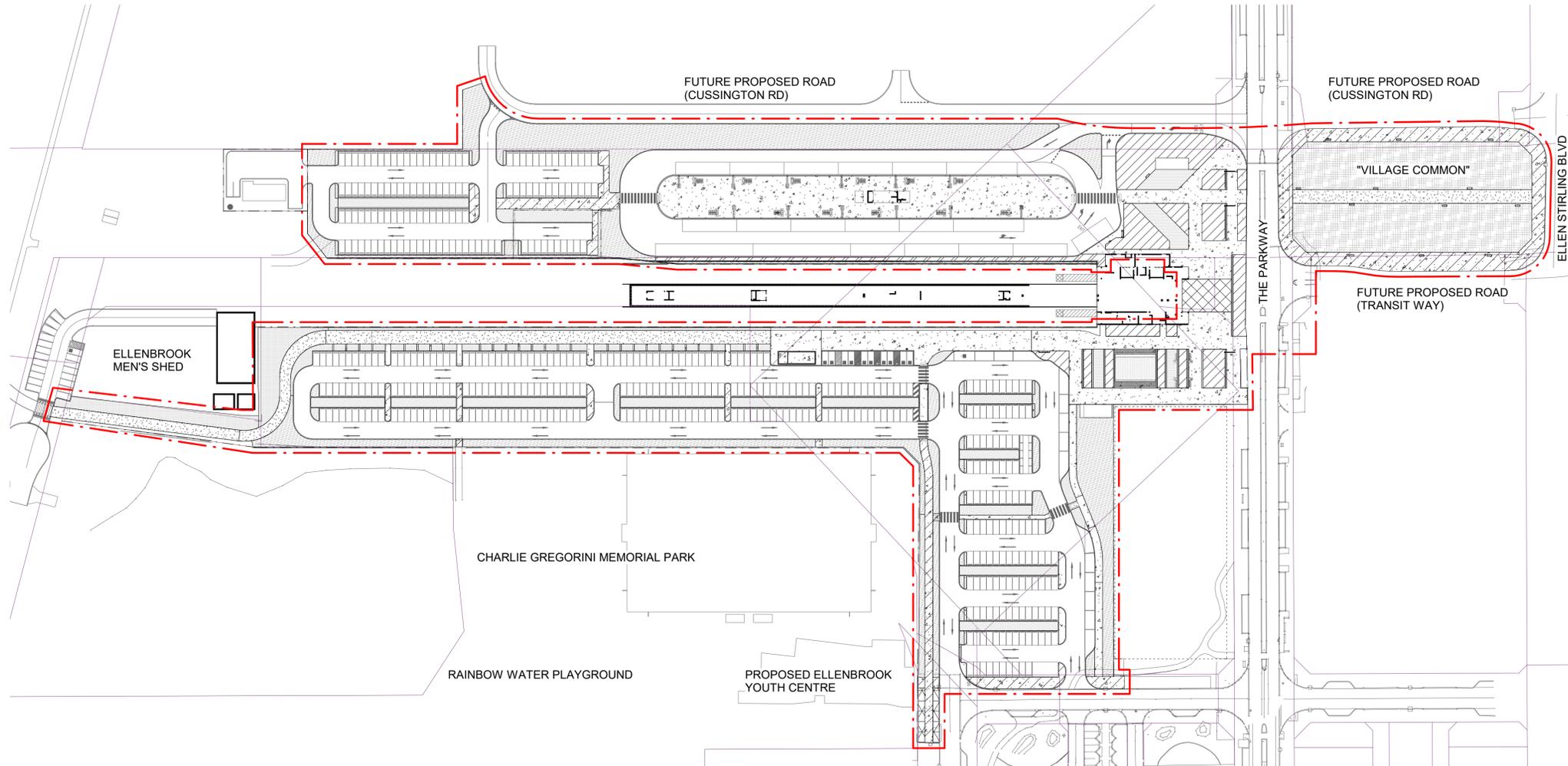
DESIGNED
DRAWN G. LOCKARD
CHECKED G. LOCKARD
APPROVED
DATE

Ellenbrook Feature Survey  
 PTA Drawing No:MLCX-SK-PENDING Rev:

## Appendix C - Landscape Plans



# MORLEY ELLENBROOK LINE ELLENBROOK PRECINCT LANDSCAPE WORKS The Parkway, Ellenbrook, WA 6069



SHEET SCHEDULE		
Sheet Number	Sheet Name	Current Revision
25-A-291-LA0001	COVERSHEET	A
25-A-291-LA0002	LEGEND & NOTES	A
25-A-291-LA0006	SCHEDULES	A
25-A-291-LA0010	SITE PLAN	A
25-A-291-LA0035	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0036	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0037	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0038	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0039	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0040	UNDERGROUND LANDSCAPE INFRASTRUCTURE	A
25-A-291-LA0050	GRADING PLAN	A
25-A-291-LA0051	GRADING PLAN	A
25-A-291-LA0052	GRADING PLAN	A
25-A-291-LA0053	GRADING PLAN	A
25-A-291-LA0054	GRADING PLAN	A
25-A-291-LA0055	GRADING PLAN	A
25-A-291-LA0065	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0066	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0067	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0068	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0069	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0070	GENERAL ARRANGEMENT & FINISHES PLAN	A
25-A-291-LA0080	PLANTING PLAN	A
25-A-291-LA0081	PLANTING PLAN	A
25-A-291-LA0082	PLANTING PLAN	A
25-A-291-LA0083	PLANTING PLAN	A
25-A-291-LA0084	PLANTING PLAN	A
25-A-291-LA0085	PLANTING PLAN	A
25-A-291-LA0115	LANDSCAPE DETAILS - WALLS	A
25-A-291-LA0116	LANDSCAPE DETAILS - ARBOUR	A
25-A-291-LA0118	LANDSCAPE DETAILS - PAVEMENTS	A
25-A-291-LA0160	LANDSCAPE DETAILS - SOFTSCAPE	A
25-A-291-LA0161	LANDSCAPE DETAILS - SOFTSCAPE	A
25-A-291-LA0162	LANDSCAPE DETAILS - SOFTSCAPE	A

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

1 25-A-291-LA0001  
1 : 1000

Model Rev: REFERENCE DESIGN Issued: 2021

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

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REFERENCES	SCALE	DESIGNED
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		CHECKED: Scott Lang
		APPROVED: Manoj Aravind
		DATE: 04/06/21

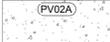
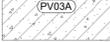
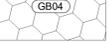
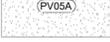
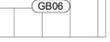
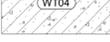
Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
COVERSHEET

PTA Drawing No: 25-A-291-LA0001 Rev: A

**LEGEND**

	PV01A High Quality Stone Unit Paver (trafficable) Refer Detail and Material Schedule.		FN01 Bike Hoop Refer Material Schedule		GB01 High Quality Amenity Planting Refer Detail and Planting Schedule.		TR01 1500L Tree Refer Detail and Planting Schedule.
	PV02A High Quality Insitu Exposed Aggregate Concrete (trafficable) Refer Detail and Material Schedule.		FN02 Dual Bin Enclosure Refer Material Schedule.		GB02 Standard Amenity Planting Refer Detail and Planting Schedule.		TR02 500L Tree Refer Detail and Planting Schedule.
	PV02B Standard Grey Brushed Finish Insitu Concrete (non-trafficable) Refer Detail and Material Schedule.		FN03 Drinking Fountain with 'Dog Watering Bowl' Refer Material Schedule.		GB03 Basic Amenity Planting Refer Detail and Planting Schedule.		TR03 200L Tree Refer Detail and Planting Schedule.
	PV03A Concrete Unit Paver to Match Existing Refer PTA Specification and Material Schedule.		FN04 Bench Seat Refer Material Schedule.		GB04 Swales and Basins Refer Detail and Planting Schedule.		TR04 100L Tree Refer Detail and Planting Schedule.
	PV05A Red Asphalt Refer PTA Specification and Material Schedule.		FN05 Electrical General Purpose Outlet Refer Material Schedule.		GB06 Tubestock Revegetation Refer Detail and Planting Schedule.		TR04A 100L Swale Tree Refer Detail and Planting Schedule.
	PV08A Brick Paving Refer Detail and Material Schedule.		FN06 General Purpose Water Service Refer Material Schedule.		GB08 Mulch Only Refer Detail and Planting Schedule.		Existing Tree to be Retained and Protected.
	WT01 Brick Seating Wall Refer Detail and Material Schedule.		FN07 USB Charging Point Refer Material Schedule.		LS01 Irrigated Lawn Refer Detail and Material Schedule.		Existing Tree to be Relocated and Reinstated.
	WT04 Concrete Steps with Seating Refer Detail and Material Schedule.		FX01 Non-Slip Tree Pit Refer Material Schedule.				Existing Tree to be Removed.
	WT06 Insitu Concrete Retaining Wall Refer Detail and Material Schedule.		FX02A Core Drilled SS Bollard Refer Material Schedule.				
	SC01 Soil Cell Refer Detail and Material Schedule.		FX02B Removable SS Bollard Refer Material Schedule.				
	Landscape Works Boundary.		Existing Street Light Pole				
	Cadastral Boundary.		LU01 Light Unit 01 - Pole-top Light Refer Material Schedule and Public Realm Decorative Lighting Strategy.				
	Fenceline Refer Civil Engineers' Documentation.		LU02 Light Unit 02 - Pole-top Light (to match existing Ellenbrook town centre street lighting strategy) Refer Material Schedule and Public Realm Decorative Lighting Strategy.				
	Overhead Architecture Canopy Refer Architecture Documentation.		Standard Softscape Maintenance Edge (sub-surface, concealed, between pavement and softscape) Refer Material Schedule.				
	Proposed Commercial Lot Boundary..		Spot Height (mm) Refer Grading Plans.				

**NOTES:**

- DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTATION (INCLUDING THAT OF DISCIPLINES INTERFACING WITH LANDSCAPE WORKS) PRIOR TO COMMENCEMENT OF WORKS. RELEVANT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO:
  - THE CONTRACT,
  - RELEVANT LEGISLATION, STANDARDS AND CODES OF PRACTICE,
  - LANDSCAPE AND IRRIGATION DRAWINGS, TECHNICAL SPECIFICATIONS, SCHEDULES AND REPORTS,
  - ARCHITECTURAL DRAWINGS, TECHNICAL SPECIFICATIONS, SCHEDULES AND REPORTS,
  - STRUCTURAL, CIVIL SERVICES ENGINEERING DRAWINGS, TECHNICAL SPECIFICATIONS, SCHEDULES AND REPORTS,
  - INSTRUCTIONS, CONSULTANT ADVICE NOTES AND ANY OTHER CONTRACTUAL NOTIFICATIONS FROM THE MANAGING CONTRACTOR,
  - REPORTS AND STUDIES, INCLUDING ENVIRONMENTAL, ARBORICULTURAL, GEOTECHNICAL, BUSHFIRE, HERITAGE, ETC.
  - BILLS OF QUANTITIES (WHERE PROVIDED),
  - ANY OTHER INFORMATION DEEMED PERTINENT BY THE MANAGING CONTRACTOR.
- THESE DRAWINGS HAVE BEEN BASED ON A COMPILATION OF INFORMATION AND BASE DATA (INCLUDING DRAWINGS AND MODELS PROVIDED BY OTHER DISCIPLINES) AVAILABLE AT THE TIME OF PRODUCTION. THE LANDSCAPE DESIGN AND DOCUMENTATION IS RELIANT ON THE ACCURACY AND COMPLETENESS OF INFORMATION PROVIDED BY OTHERS. NO RESPONSIBILITY IS TAKEN FOR THE QUALITY OR COMPLETENESS OF INFORMATION FROM OTHERS ON WHICH THE LANDSCAPE DESIGN IS RELIANT.
- ANOMALIES, OMISSIONS, ERRORS OR DISCREPANCIES IN THE PROJECT DOCUMENTATION ARE TO BE REFERRED TO THE MANAGING CONTRACTOR AND RELEVANT DISCIPLINE SPE'S IMMEDIATELY UPON DISCOVERY FOR DETERMINATION OF RESOLUTION AND SUBSEQUENT INSTRUCTION PRIOR TO CONTINUATION OF WORKS.
- THE CONTRACTOR AND SUB-CONTRACTORS SHALL VERIFY ALL DIMENSIONS, SET-OUT, LEVELS, EXISTING AND PROPOSED INTERFACING WORKS (INCLUDING SERVICES AND SUB-SURFACE WORKS) PRIOR TO COMMENCEMENT ON SITE, PREPARATION OF DETAIL/SHOP DRAWINGS, AND FABRICATION OF CONSTRUCTION / BUILDING COMPONENTS.
- SET-OUT OF ALL WORKS SHALL BE UNDERTAKEN BY LICENSED SURVEYOR UTILISING 'ISSUE FOR CONSTRUCTION' DIGITAL FILES. LEVELS TO BE VERIFIED AGAINST THE 'ISSUE FOR CONSTRUCTION' DRAWINGS.
- ALL DIMENSIONS ARE IN MM. DO NOT SCALE OFF DRAWINGS.
- THE CONTRACTOR IS TO PROVIDE SHOP DRAWINGS (CAD DRAFTED TO SCALE WITH ADEQUATE NOTES AND DIMENSIONS FOR REVIEW AND FABRICATION) TO THE MANAGING CONTRACTOR FOR REVIEW PRIOR TO FABRICATION. FIXINGS AND FASTENING SELECTIONS ARE TO BE CONFIRMED VIA THE SHOP DRAWING PROCESS IN ACCORDANCE WITH THE AESTHETIC AND STRUCTURAL REQUIREMENTS OF THE DESIGN DOCUMENTATION.
- WHERE STRUCTURAL FIXINGS AND CONNECTIONS AND / OR THEIR SET-OUT HAVE NOT BEEN NOMINATED IN THE DOCUMENTATION, THE CONTRACTOR IS TO VERIFY SUITABLE SELECTIONS AND SET-OUT WITH THE MANAGING CONTRACTOR PRIOR TO FABRICATION.
- CONSTRUCTION WORKS SHALL ONLY BE UNDERTAKEN ON RECEIPT OF 'ISSUE FOR CONSTRUCTION' DOCUMENTATION.
- TREES IDENTIFIED FOR RETENTION IN THE DOCUMENTS SHALL BE PROTECTED FOR THE DURATION OF CONSTRUCTION WORKS IN ACCORDANCE WITH 'TREE PROTECTION SPECIFICATIONS'. (NB: TREE SPECIFICATIONS ARE SUBJECT TO DEVELOPMENT AND CONFIRMATION IN THE NEXT DESIGN STAGE).
- ALL PAVED SURFACES ARE TO BE CONSTRUCTED IN COMPLIANCE WITH PROJECT 'DESIGN FOR DISABLED ACCESS' (DDA) REQUIREMENTS AND AS1428. DISCREPANCIES IN THE DOCUMENTATION PERTAINING TO PAVEMENT DESIGN AND DDA REQUIREMENTS ARE TO BE REFERRED TO THE MANAGING CONTRACTOR FOR RESOLUTION.
- ALL SURFACES SHALL BE FREE-DRAINING. THE CONTRACTOR SHALL ENSURE SURFACES GRADES FALL AWAY FROM BUILDINGS, STRUCTURES, FURNITURE, KERB RAMPS AND PATHS OF TRAVEL.
- SET-OUT AND SELECTION OF LIGHT FITTINGS ARE A WORK IN PROGRESS AND ARE NOT YET CAPTURED IN THE LANDSCAPE DOCUMENTATION FOR REFERENCE DESIGN. LIGHTING DETAILS WILL BE CONFIRMED IN THE NEXT PHASE OF DESIGN. IN THE INTERIM, PLEASE REFER TO PRELIMINARY LIGHTING STRATEGIES RD\_LA\_SK035 / RD\_LA\_SK038 FOR LIGHTING INTENT.
- UNIT PAVING HEADER COURSES ARE NOT SHOWN DISTINCTLY ON FINISHES PLANS. REFER MATERIAL SCHEDULE FOR REQUIREMENTS.

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL
ORIG SIZE <b>A1</b> AT ORIGINAL PLOT SIZE 						



REFERENCES	SCALE 1 : 100 (@ A1)
DATUM HORIZONTAL: PCG2020 VERTICAL: AHD71	DESIGNED UDLA & TCL DRAWN Jacob Conquer CHECKED Scott Lang APPROVED Manoj Aravind DATE 04/06/21


**MORLEY ELLENBROOK LINE**  
**ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE**  
**LEGEND & NOTES**  
 PTA Drawing No: **25-A-291-LA0002** Rev: **A**

Hardscape & Softscape		
Type	Description	Area
GB01	High Quality Irrigated Amenity Planting	1628 m <sup>2</sup>
GB02	Standard Non-Irrigated Amenity Planting	1524 m <sup>2</sup>
GB03	Basic Non-Irrigated Amenity Planting	5138 m <sup>2</sup>
GB04	Non-Irrigated Swales and Basin	1644 m <sup>2</sup>
GB06	Non-Irrigated Tubestock Revegetation	3088 m <sup>2</sup>
GB08	Mulch Only	94 m <sup>2</sup>
LS01	Irrigated Lawn	153 m <sup>2</sup>
PV01A	High Quality Stone Unit Paver	220 m <sup>2</sup>
PV02A	High Quality Insitu Exposed Aggregate Concrete (Trafficable)	6017 m <sup>2</sup>
PV02B	Standard Grey Insitu Brushed Finish Concrete	251 m <sup>2</sup>
PV03A	Concrete Unit Paver to Match Existing	2534 m <sup>2</sup>
PV04A	Tactile Ground Surface Indicator Pavers - Dots	119 m <sup>2</sup>
PV04B	Tactile Ground Surface Indicator Pavers - T-Bar	15 m <sup>2</sup>
PV05A	Red Asphalt	1785 m <sup>2</sup>
PV08A	Brick Paving	420 m <sup>2</sup>

Trees		
Type Mark	Type	Count
TR01	1500L Tree	9
TR02	500L Tree	125
TR03	200L Tree	125
TR04	100L Tree	95
TR04A	100L Swale Tree	99
Grand total		453

Walls		
Type Mark	Description	Length
WT01	Brick Seating Wall	194 m
WT06	Insitu Concrete Retaining Wall	448 m

Stairs		
Type Mark	Description	Count
WT04	High Quality Insitu Concrete Steps	2

Furniture & Fixings		
Type Mark	Type	Count
CA01	Arbour Structure	13
FN01	Bike Hoop	6
FN02	Dual Bin Enclosure	17
FN03	Drinking Fountain with Dog Bowl	2
FN04	Bench Seat	33
FN05	Electrical General Purpose Outlet	5
FN06	General Purpose Water Service	5
FN07	USB Charging Point	5
FX01	Non-Slip Tree Pit	32
FX02A	SS Bollard Core Drilled	43
FX02B	SS Bollard Removable	9

Edges		
Type Mark	Description	Length
ED04A	Standard Softscape Maintenance Edge (Sub-surface)	450 m

Planting Schedule
Garden Bed Species: GB01, GB02, GB03
<i>Acacia gregorii</i>
<i>Acacia lasiocarpa 'Glow Wattle'</i>
<i>Acacia saligna Prostrate</i>
<i>Acacia willdenowiana</i>
<i>Adenanthos cuneatus Coral Carpet</i>
<i>Anigozanthos flavidus Orange Gem</i>
<i>Anigozanthos flavidus Red</i>
<i>Anigozanthos mangliesii</i>
<i>Anigozanthos viridis</i>
<i>Banksia blechnifolia</i>
<i>Banksia nivea</i>
<i>Banksia prionotes Dwarf</i>
<i>Beaufortia aestiva</i>
<i>Boronia crenulata</i>
<i>Callistemon phoeniceus Dwarf</i>
<i>Calothamnus hirsutus</i>
<i>Calothamnus quadrifidus Little Ripper</i>
<i>Carpobrotus virescens Aussie Rambler</i>
<i>Chorizema chordata</i>
<i>Chorizema varium</i>
<i>Conospermum stoechadis</i>
<i>Conostylis candicans</i>
<i>Crowea exalta</i>
<i>Dampiera diversifolia</i>
<i>Dampiera linearis</i>
<i>Dampiera teres</i>
<i>Eremophila glabra Kalbarri Carpet</i>
<i>Hardenbergia comptoniana</i>
<i>Hemiandra pungens 'Alba'</i>
<i>Hibbertia grossulariifolia</i>
<i>Hypocalymma angustifolium</i>
<i>Hypocalymma robustum</i>
<i>Kennedia coccinea</i>
<i>Kennedia prostrata</i>
<i>Lechenaultia biloba Sky Blue</i>
<i>Lepidosperma calcicola</i>
<i>Lepidosperma gladiatum</i>
<i>Leucophyta brownii Silver Nugget</i>
<i>Lomandra katrinus</i>
<i>Lomandra nyalla</i>
<i>Lomandra tanika</i>
<i>Melaleuca huegii 'Rambler'</i>
<i>Melaleuca sariata</i>
<i>Myporum parvifolium Fine Leaf</i>
<i>Olearia axillaris 'Little Smokie'</i>
<i>Orthrosanthus multiflorus</i>
<i>Pimelea ferruginea Pink Solitaire</i>
<i>Pimelea ferruginea White Solitaire</i>
<i>Ptilotus exalta 'Phoenix'</i>
<i>Verticordia chrysantha</i>
<i>Verticordia mitchelliana</i>
<i>Veticordia monadelph</i>
<i>Westringia fruticosa Low Horizon</i>
<i>Westringia mundi</i>

Planting Schedule
Garden Bed Species: GB04
<i>Baumea juncea</i>
<i>Baumea rubiginosa</i>
<i>Carex appressa</i>
<i>Ficinia nodosa</i>
<i>Juncus pallidus</i>
<i>Lepidosperma calcicola</i>
<i>Lepidosperma longitudinale</i>
<i>Meeboldina scariosa</i>

Planting Schedule
Garden Bed Species: GB06

<i>Acacia ashbyae</i>
<i>Acacia lasiocarpa</i>
<i>Acacia pulchella</i>
<i>Acacia splendens Autumn Gold</i>
<i>Banksia ashbyii Dwarf</i>
<i>Banksia attenuata Dwarf</i>
<i>Banksia prionotes Dwarf</i>
<i>Banksia sceptrum Little Xmas Candles</i>
<i>Baumea juncea</i>
<i>Baumea rubiginosa</i>
<i>Beaufortia elegans</i>
<i>Callistemon phoeniceus Dwarf</i>
<i>Calothamnus sanguineus</i>
<i>Calothamnus hirsutus</i>
<i>Calothamnus quadrifidus Little Ripper</i>
<i>Carpobrotus virescens</i>
<i>Ficinia nodosa</i>
<i>Hardenbergia comptoniana</i>
<i>Ispogan dubius</i>
<i>Juncus pallidus</i>
<i>Kennedia coccinea</i>
<i>Kennedia prostrata</i>
<i>Lepidosperma longitudinale</i>
<i>Leucophyta brownii</i>
<i>Melaleuca laterita Dwarf</i>
<i>Melaleuca seriata</i>
<i>Melaleuca systema</i>
<i>Meleuca conothamnoides</i>
<i>Olearia axillaris</i>
<i>Scaevola crassifolia</i>
<i>Verticordia plumosa</i>

Planting Schedule
Tree Species
<i>Banksia grandis</i>
<i>Banksia integrifolia</i>
<i>Corymbia calophylla</i>
<i>Eucalyptus gomphocephala</i>
<i>Eucalyptus rudis</i>
<i>Eucalyptus todtiana</i>
<i>Eucalyptus torquata</i>
<i>Eucalyptus victrix</i>
<i>Eucalyptus wandoo</i>
<i>Melaleuca cuticularis</i>
<i>Melaleuca leucadendra</i>
<i>Melaleuca preissiana</i>
<i>Melaleuca quinquerivaria</i>
<i>Melaleuca raphiophylla</i>

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

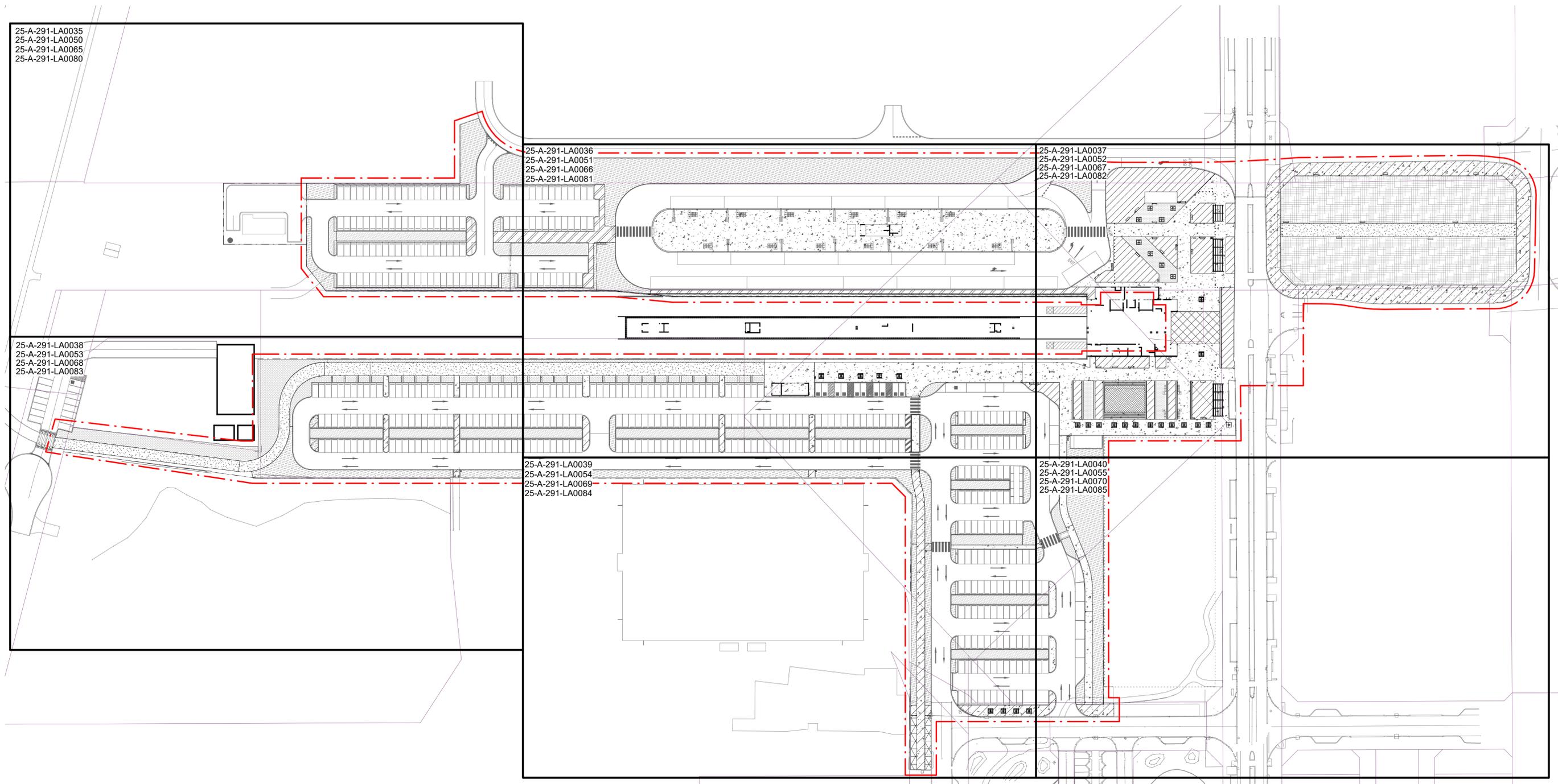
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REFERENCES	SCALE	DESIGNED
	(@ A1)	UDLA & TCL
		DRAWN: Jacob Conquer
		CHECKED: Scott Lang
		APPROVED: Manoj Aravind
		DATE: 04/06/21

MORLEY ELLENBROOK LINE	
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE SCHEDULES	
PTA Drawing No: 25-A-291-LA0006	Rev: A



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1 SITE PLAN  
1 : 750

Model Rev:REFERENCE DESIGN Issued:2021

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
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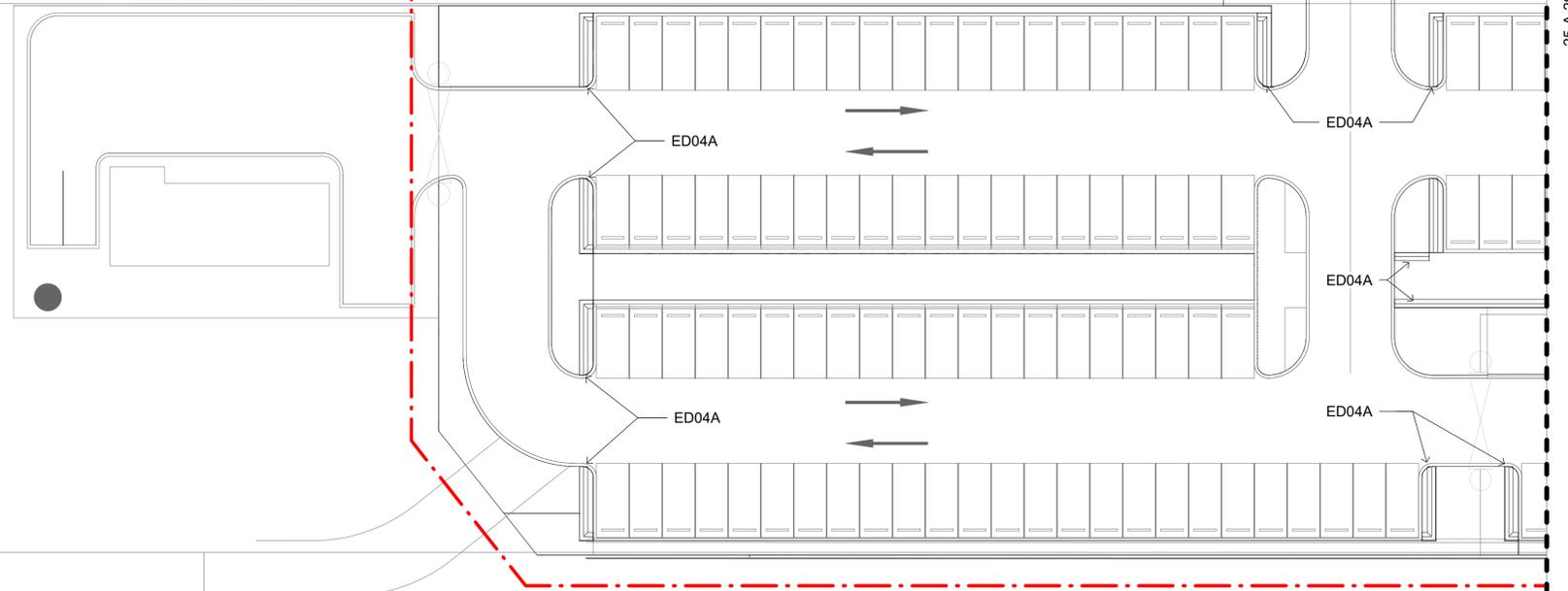
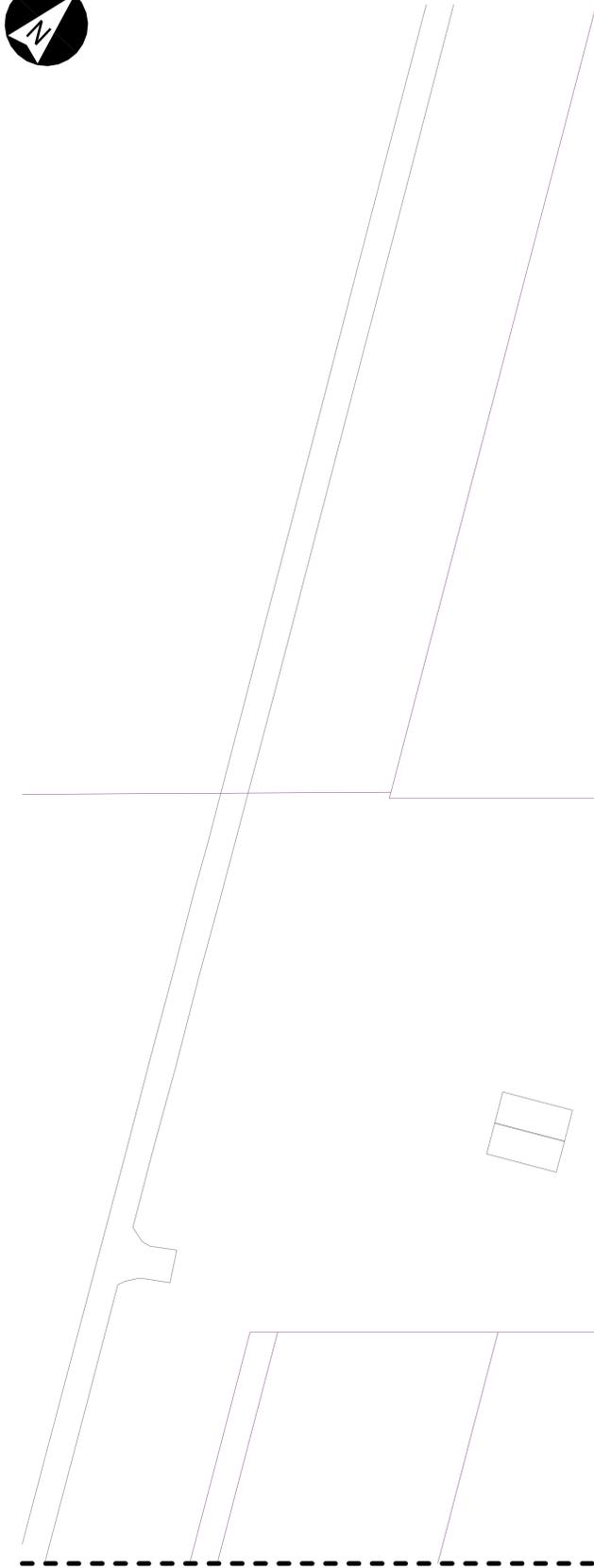
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		CHECKED Scott Lang
		APPROVED Manoj Aravind
		DATE 04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
SITE PLAN	
PTA Drawing No: 25-A-291-LA0010	Rev: A



25-A-291-LA0036

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25-A-291-LA0035

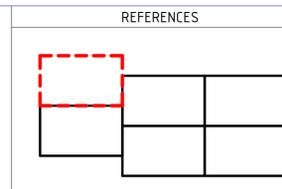
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25-A-291-LA0038

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Model Rev:REFERENCE DESIGN Issued:2021

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HORIZONTAL: PCG2020  
VERTICAL: AHD71

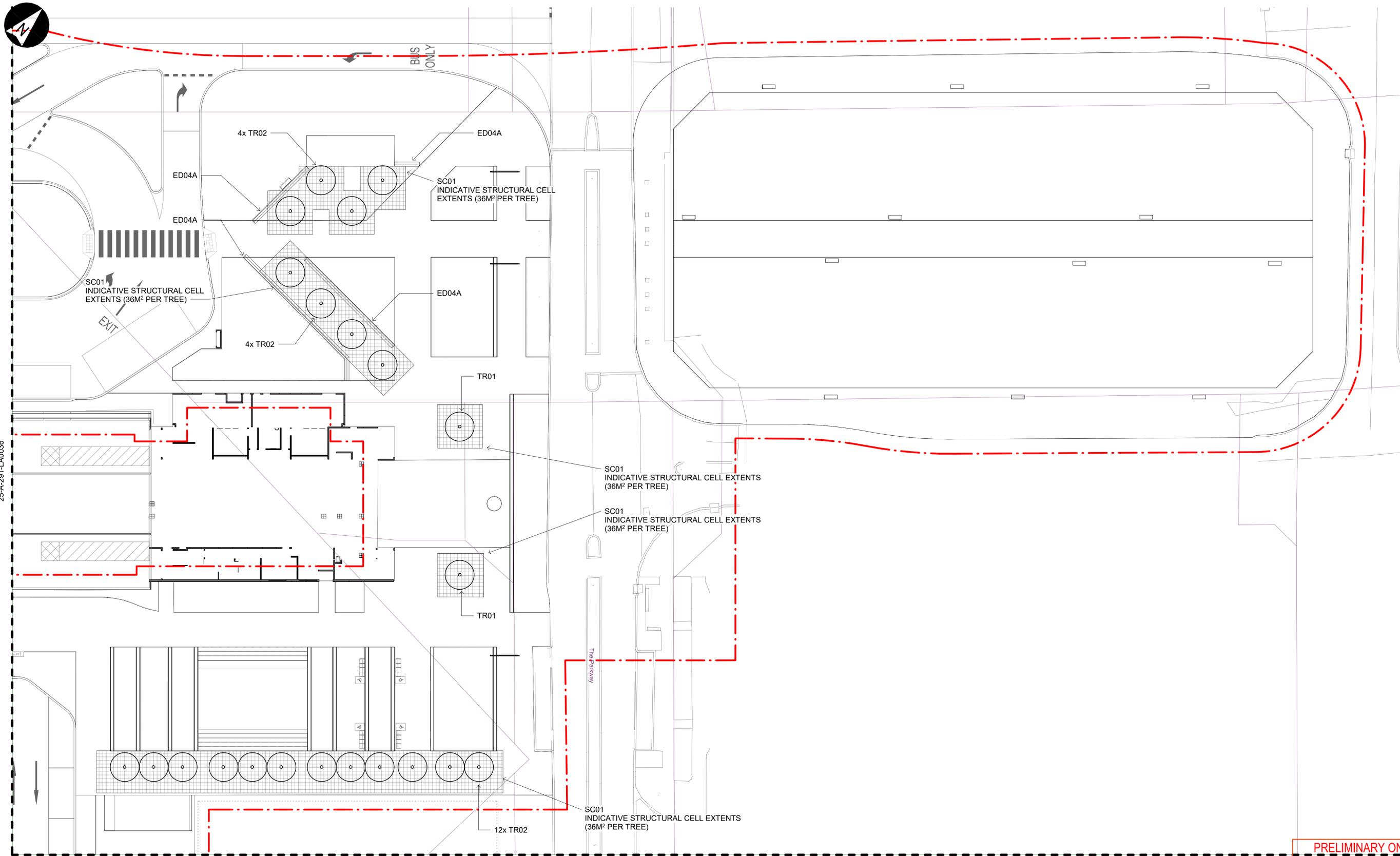
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DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
UNDERGROUND LANDSCAPE INFRASTRUCTURE

PTA Drawing No: 25-A-291-LA0035 Rev: A





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1 25-A-291-LA0037  
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Model Rev:REFERENCE DESIGN Issued:2021

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A01	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL

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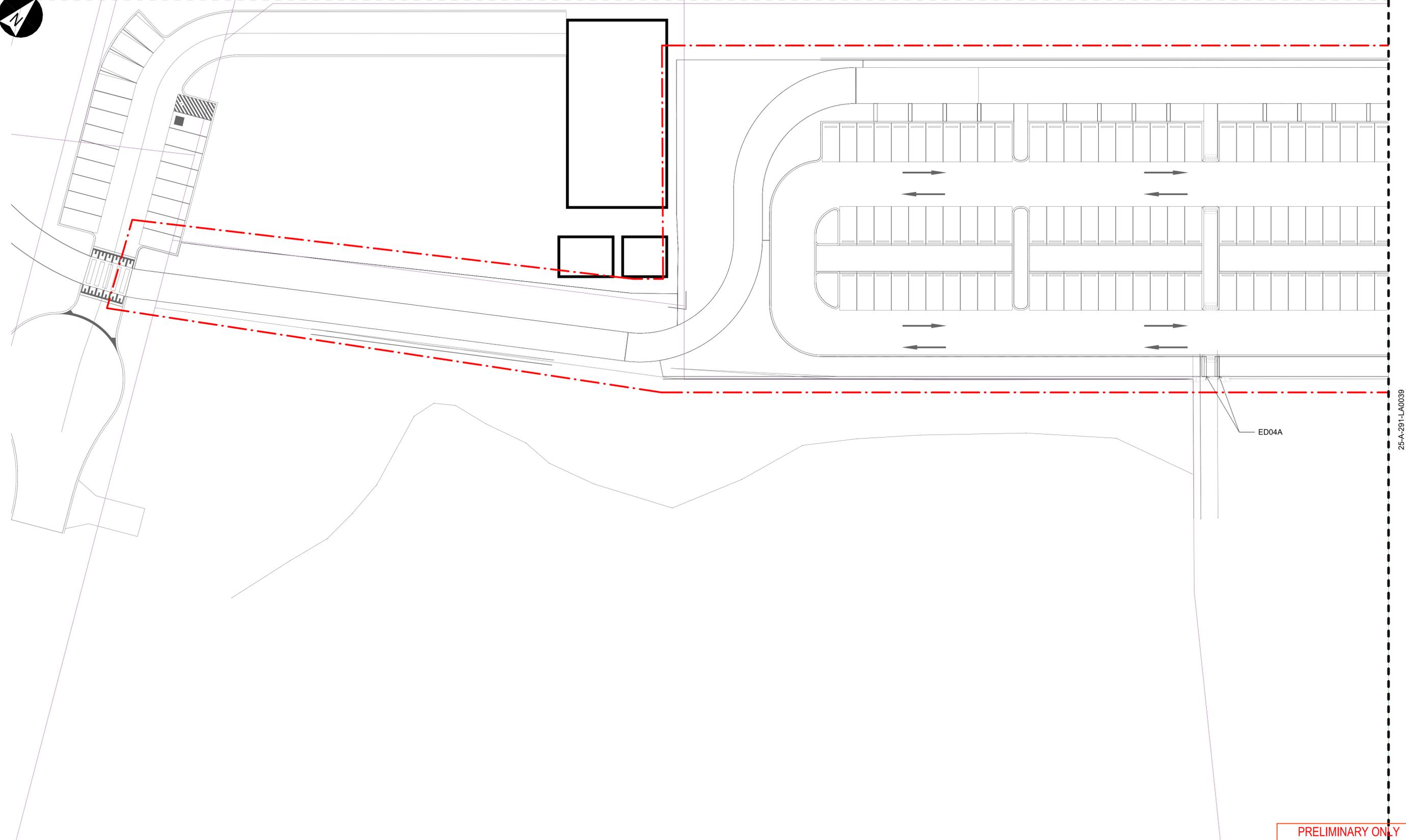
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	DATUM	DRAWN Jacob Conquer
	HORIZONTAL: PCG2020	CHECKED Scott Lang
	VERTICAL: AHD71	APPROVED Manoj Aravind
		DATE 04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
UNDERGROUND LANDSCAPE INFRASTRUCTURE	
PTA Drawing No: 25-A-291-LA0037	Rev: A

25-A-291-LA0035



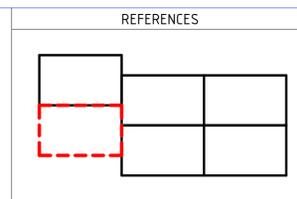
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1 25-A-291-LA0038  
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Model Rev:REFERENCE DESIGN Issued:2021

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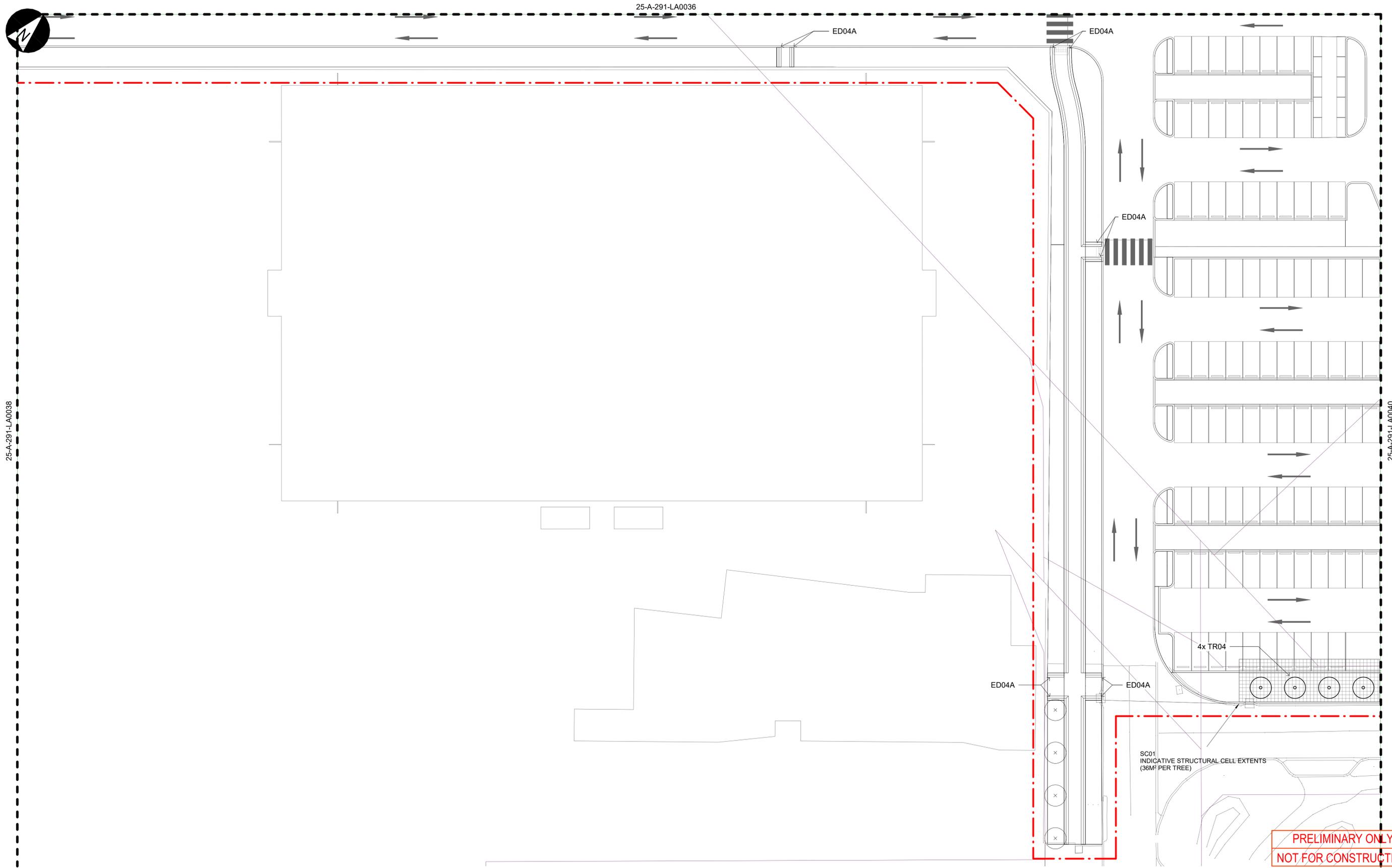
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VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
UNDERGROUND LANDSCAPE INFRASTRUCTURE

PTA Drawing No: 25-A-291-LA0038 Rev: A



1 25-A-291-LA0039  
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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A01	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL

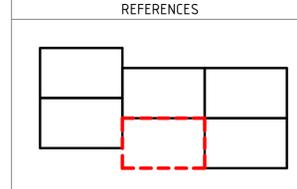
  

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DATUM	DRAWN Jacob Conquer
HORIZONTAL: PCG2020	CHECKED Scott Lang
VERTICAL: AHD71	APPROVED Manoj Aravind
	DATE 04/06/21

MORLEY ELLENBROOK LINE	
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
UNDERGROUND LANDSCAPE INFRASTRUCTURE	
PTA Drawing No: 25-A-291-LA0039	Rev: A



25-A-291-LA0039

ED04A

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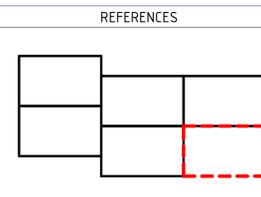
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A01	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL

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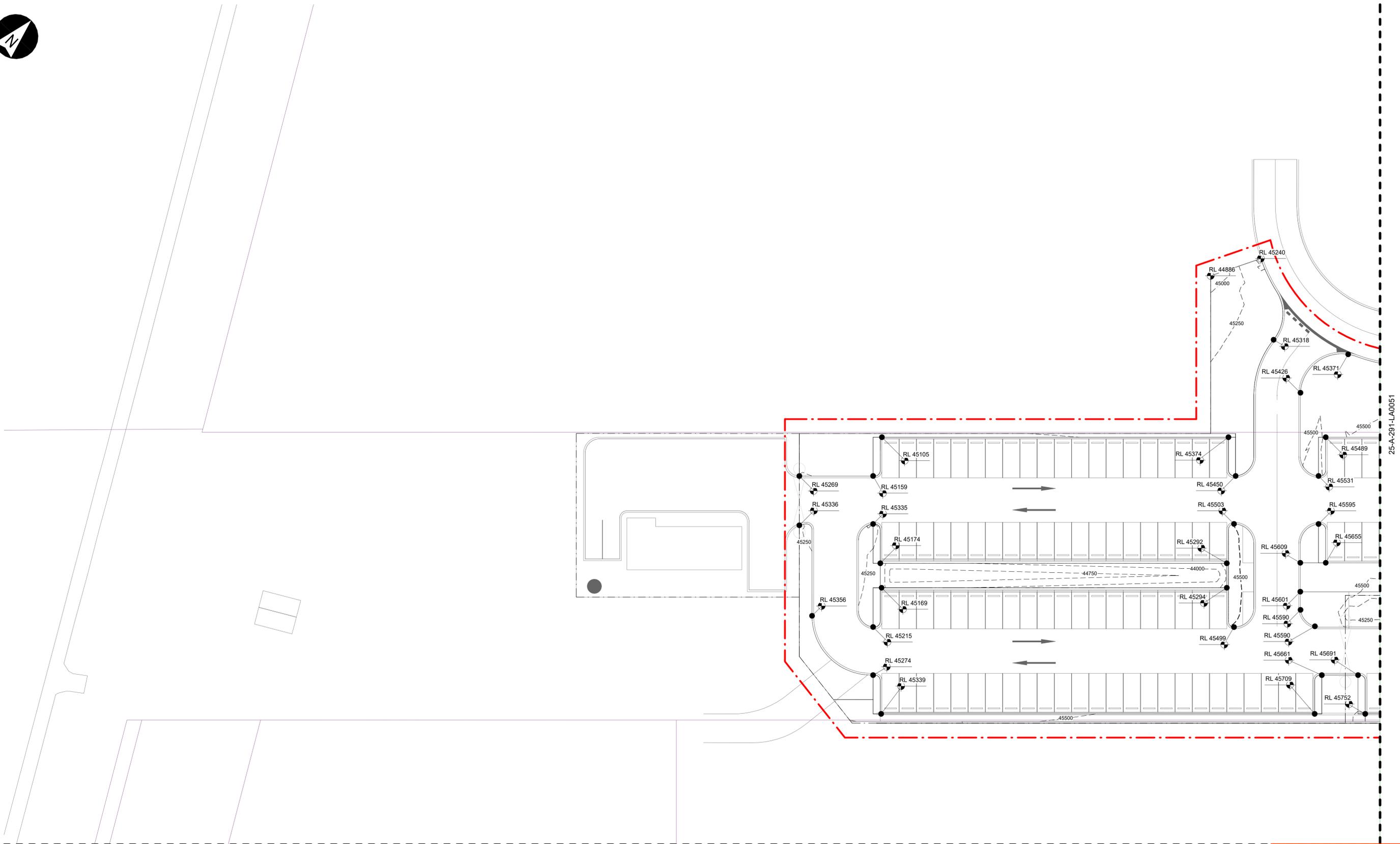
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DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
UNDERGROUND LANDSCAPE INFRASTRUCTURE

PTA Drawing No: 25-A-291-LA0040 Rev: A



25-A-291-LA0051

25-A-291-LA0053

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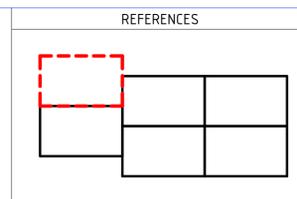
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Model Rev:REFERENCE DESIGN Issued:2021

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A01	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL

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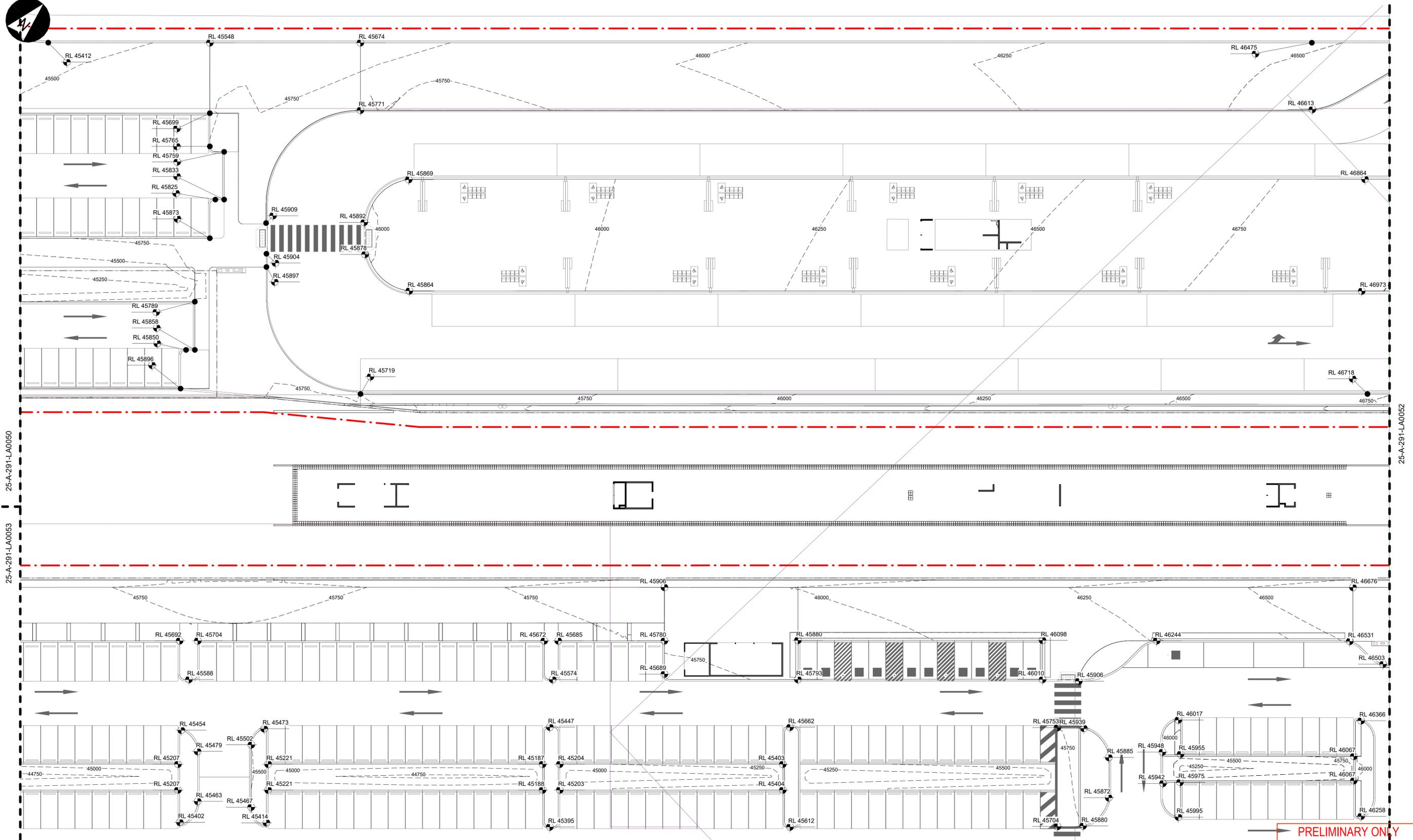
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VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GRADING PLAN

PTA Drawing No: 25-A-291-LA0050 Rev: A



25-A-291-LA0050  
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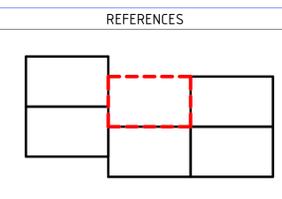
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**NOT FOR CONSTRUCTION**

Model Rev:REFERENCE DESIGN Issued:2021

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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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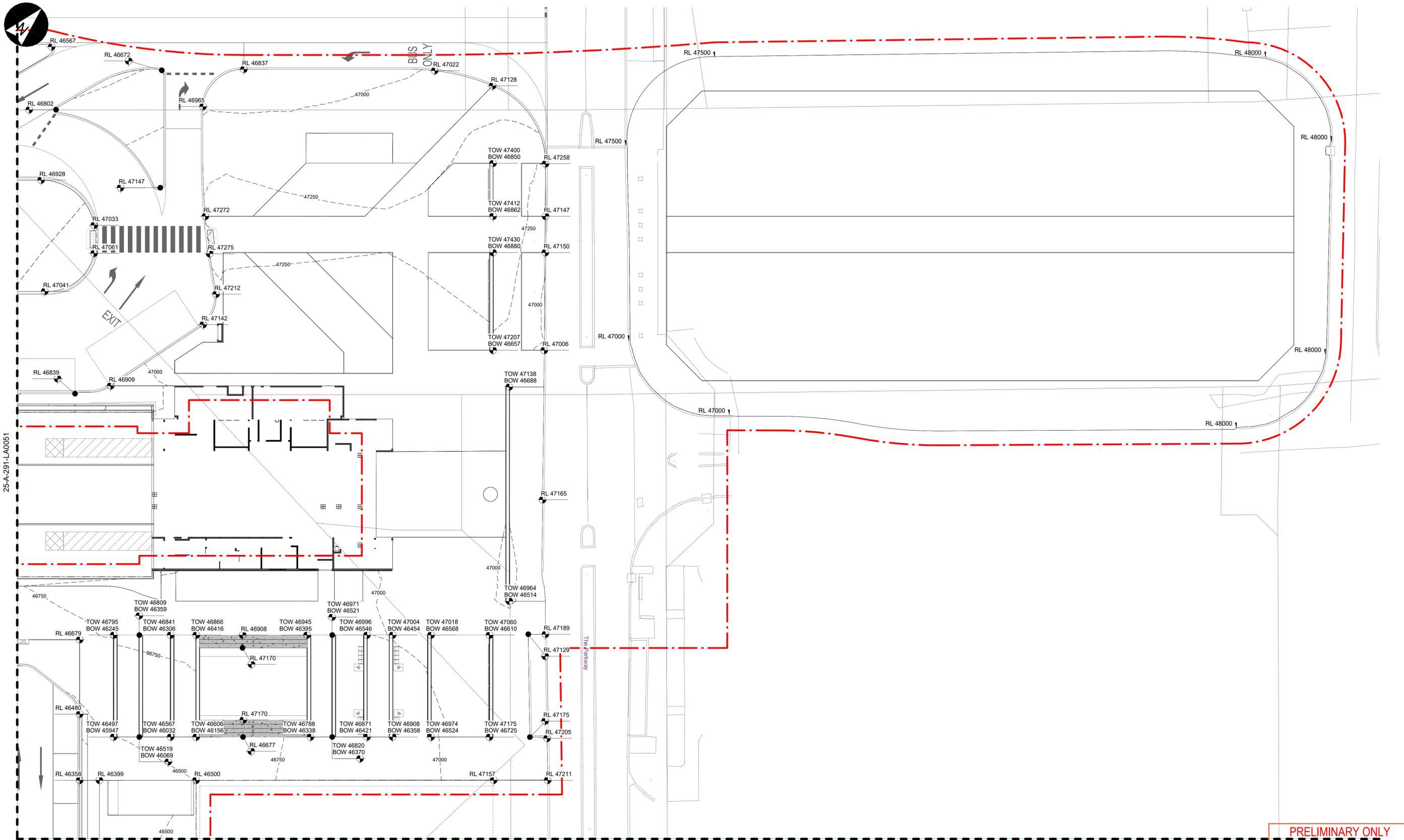


SCALE  
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DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GRADING PLAN  
PTA Drawing No: 25-A-291-LA0051 Rev: A



**PRELIMINARY ONLY**  
**NOT FOR CONSTRUCTION**

1 25-A-291-LA0052  
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25-A-291-LA0055

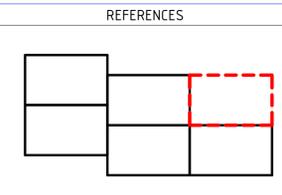
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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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A01	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL

ORIG SIZE	A1	AT ORIGINAL PLOT SIZE
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SCALE	1 : 250 (@ A1)
DATUM	HORIZONTAL: PCG2020 VERTICAL: AHD71
DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

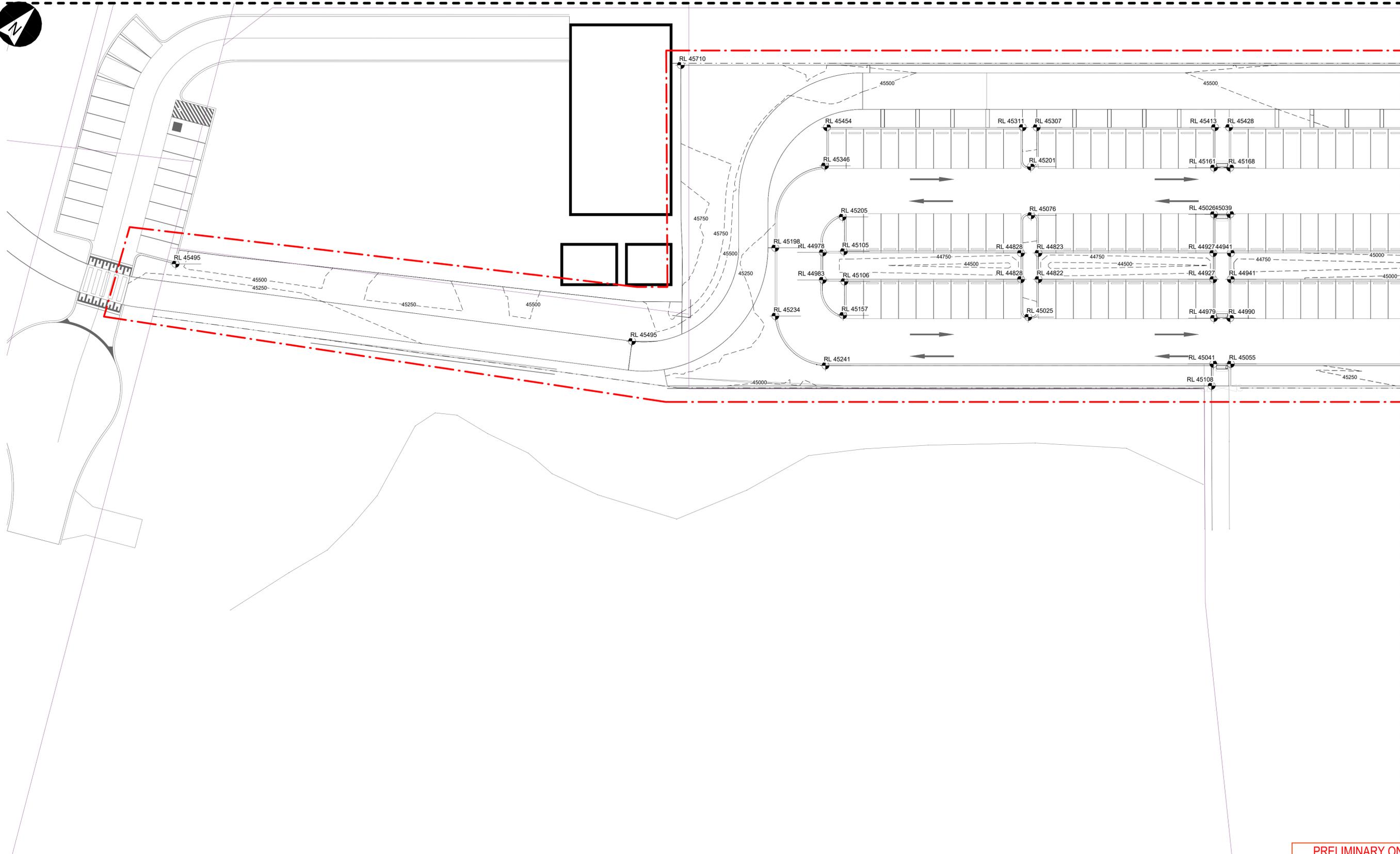
Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE

GRADING PLAN

PTA Drawing No: 25-A-291-LA0052 Rev: A



25-A-291-LA0054

1 25-A-291-LA0053  
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PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

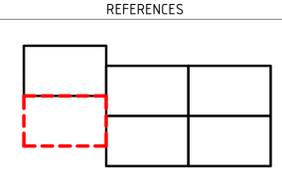
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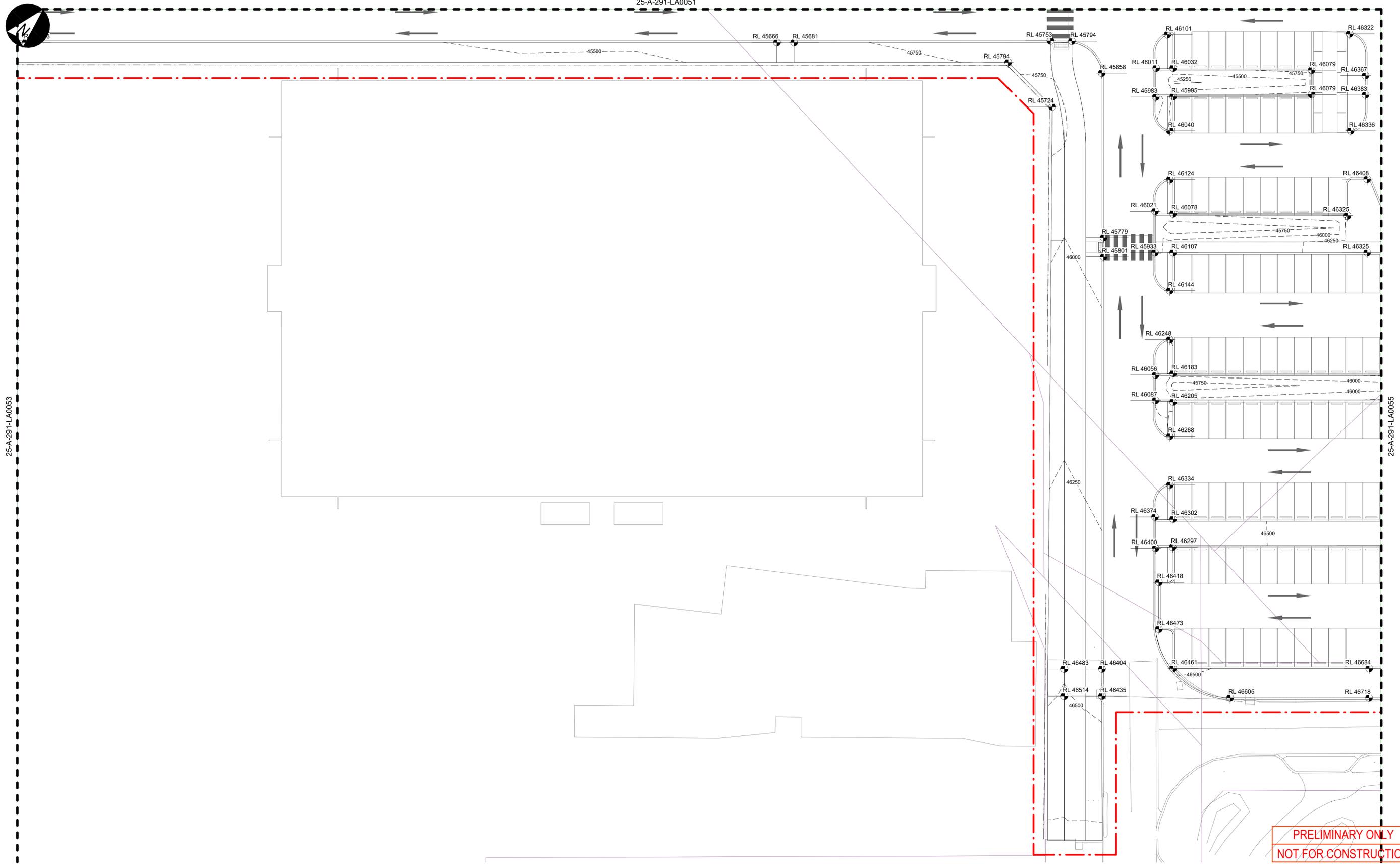


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DATUM  
HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

	MORLEY ELLENBROOK LINE
	ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE GRADING PLAN
PTA Drawing No: 25-A-291-LA0053 Rev: A	



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

25-A-291-LA0054  
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REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
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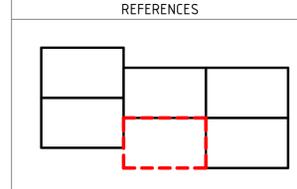
  

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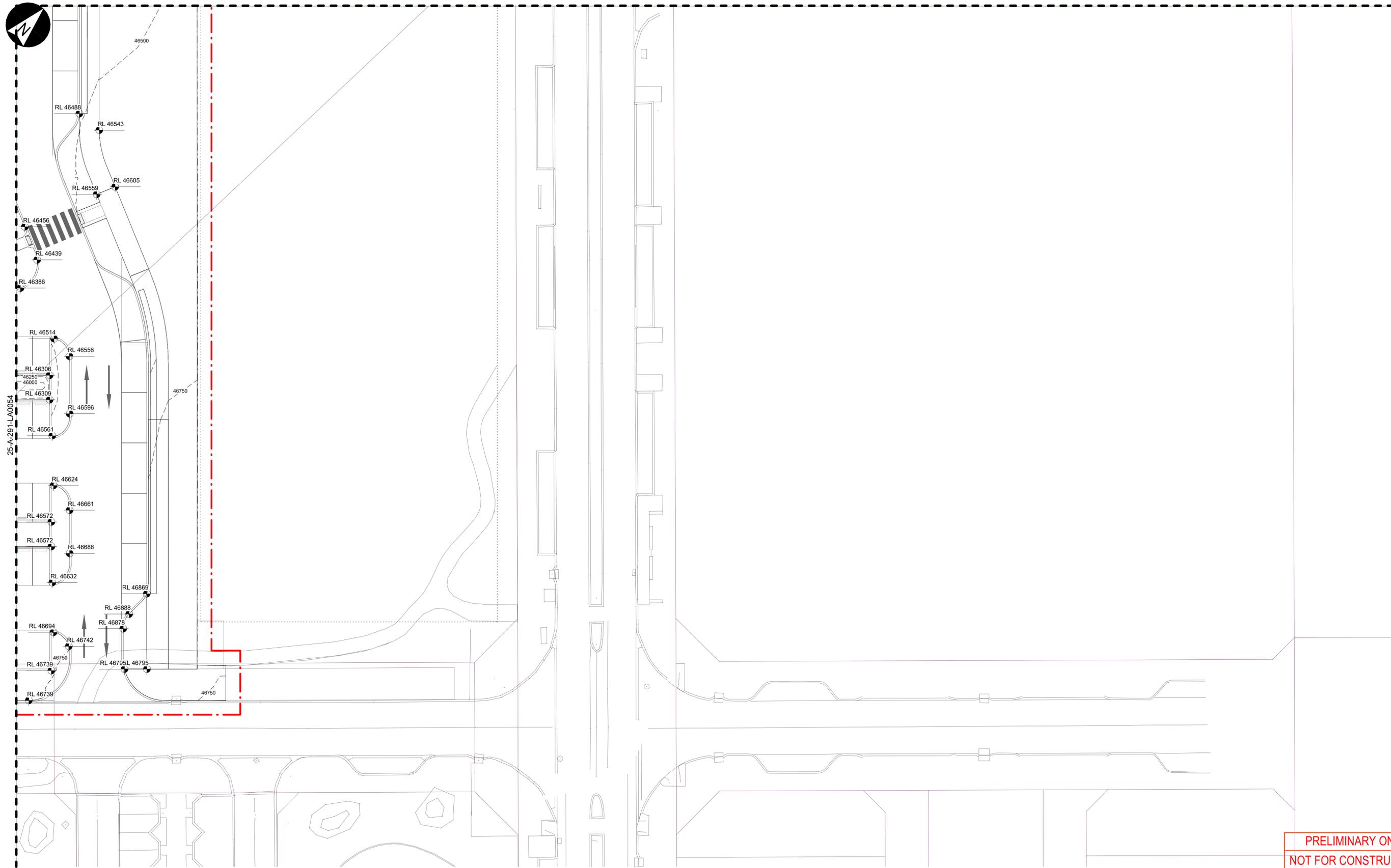


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DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
GRADING PLAN	
PTA Drawing No: 25-A-291-LA0054	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

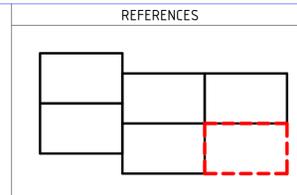
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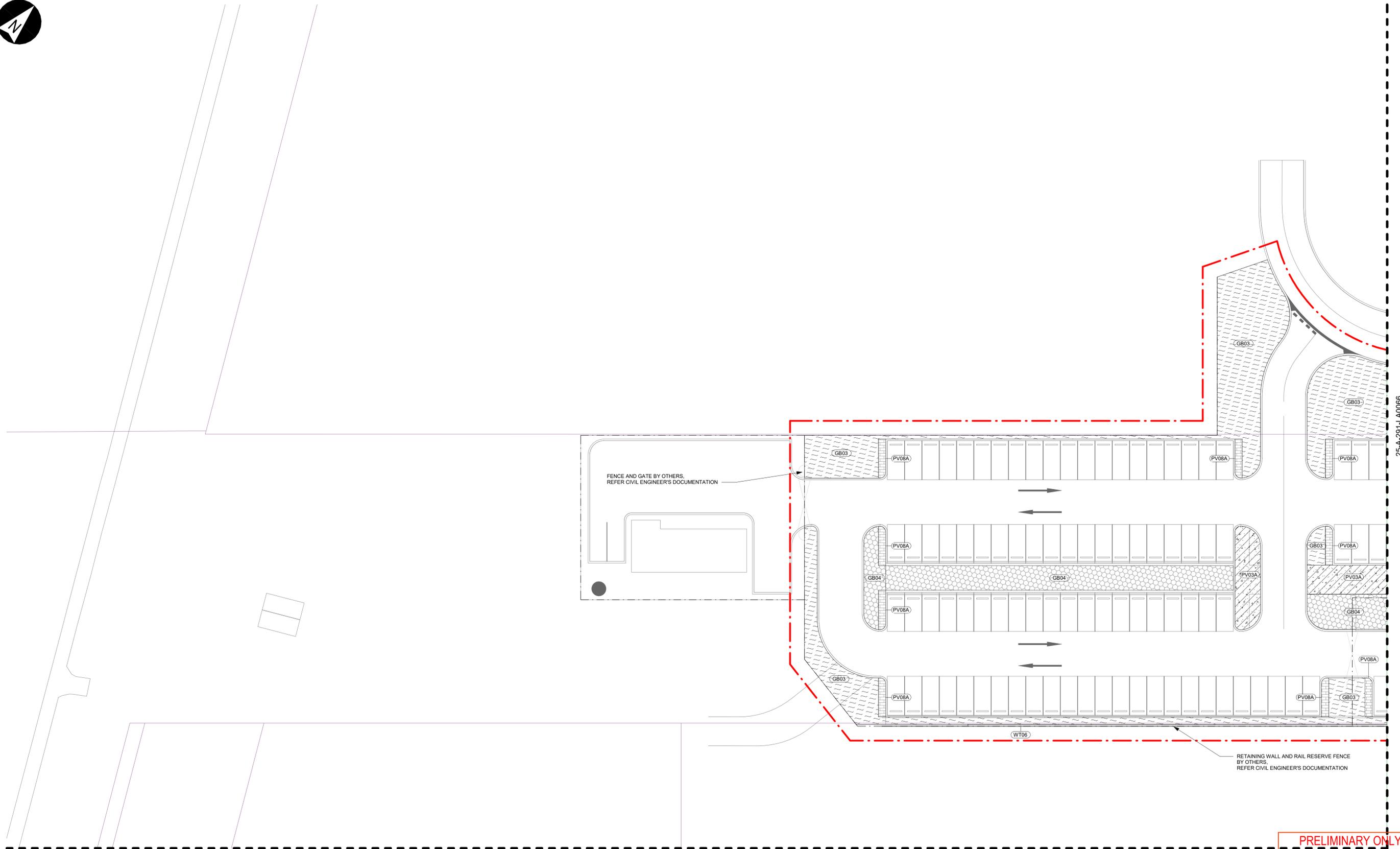


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DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GRADING PLAN

PTA Drawing No: 25-A-291-LA0055 Rev: A



25-A-291-LA0066

1 25-A-291-LA0065  
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25-A-291-LA0068

**PRELIMINARY ONLY**  
**NOT FOR CONSTRUCTION**

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A02.01	13/05/21	Issue for Draft RD Submission	UDLA	JC	SL	SL
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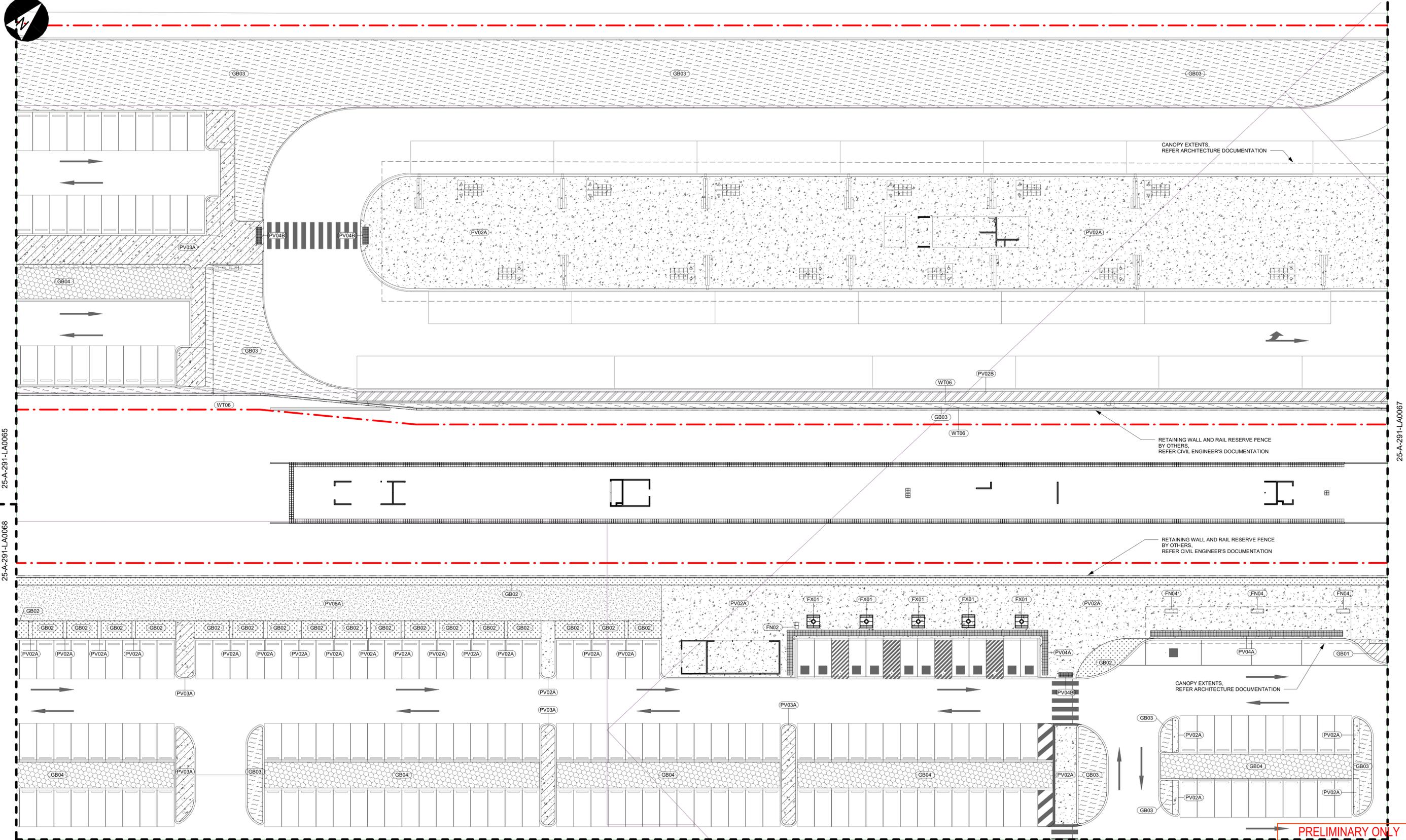
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Model Rev:REFERENCE DESIGN Issued:2021

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	DATUM	DRAWN Jacob Conquer
	HORIZONTAL: PCG2020	CHECKED Scott Lang
	VERTICAL: AHD71	APPROVED Manoj Aravind
		DATE 04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
GENERAL ARRANGEMENT & FINISHES PLAN	
PTA Drawing No: 25-A-291-LA0065	Rev: A



25-A-291-LA0065  
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25-A-291-LA0067

25-A-291-LA0069

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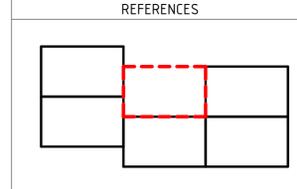
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A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

ORIG SIZE A1 AT ORIGINAL PLOT SIZE

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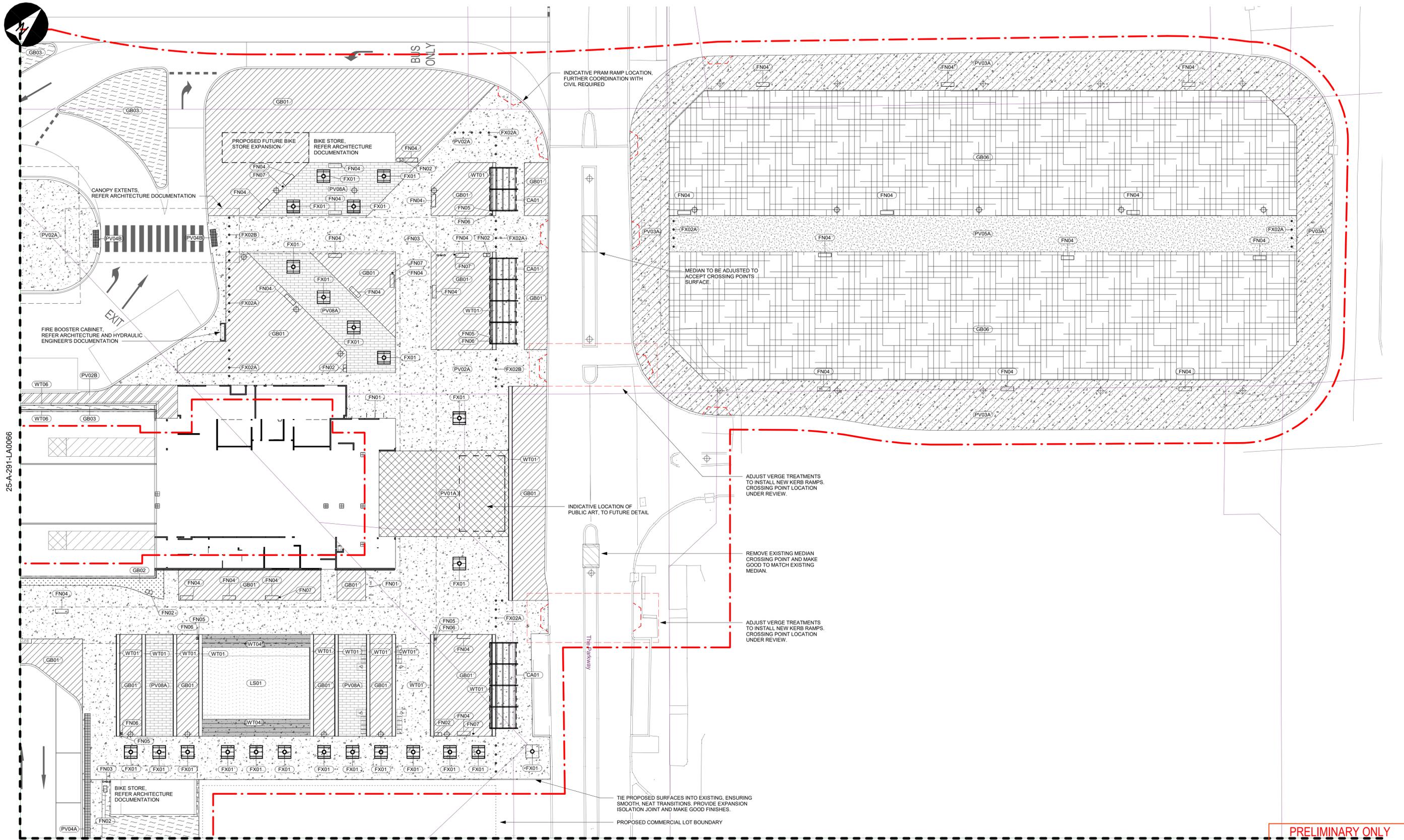
DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GENERAL ARRANGEMENT & FINISHES PLAN

PTA Drawing No: 25-A-291-LA0066 Rev: A



25-A-291-LA0066

25-A-291-LA0070

**PRELIMINARY ONLY**  
**NOT FOR CONSTRUCTION**

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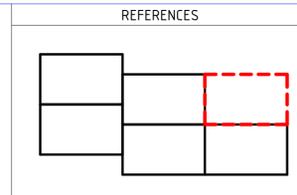
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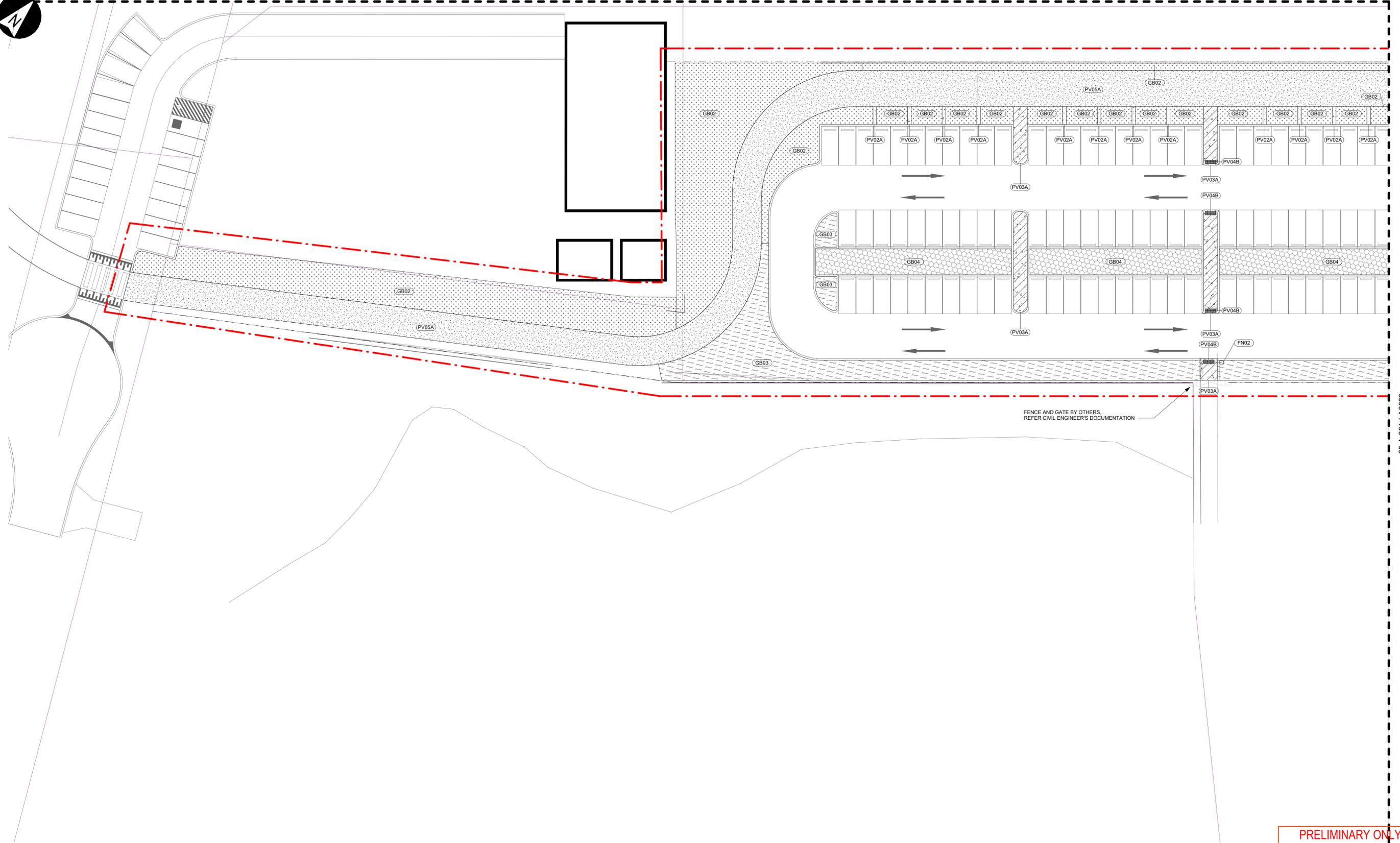
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DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GENERAL ARRANGEMENT & FINISHES PLAN

PTA Drawing No: 25-A-291-LA0067 Rev: A



25-A-291-LA0069

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

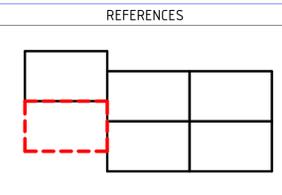
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A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

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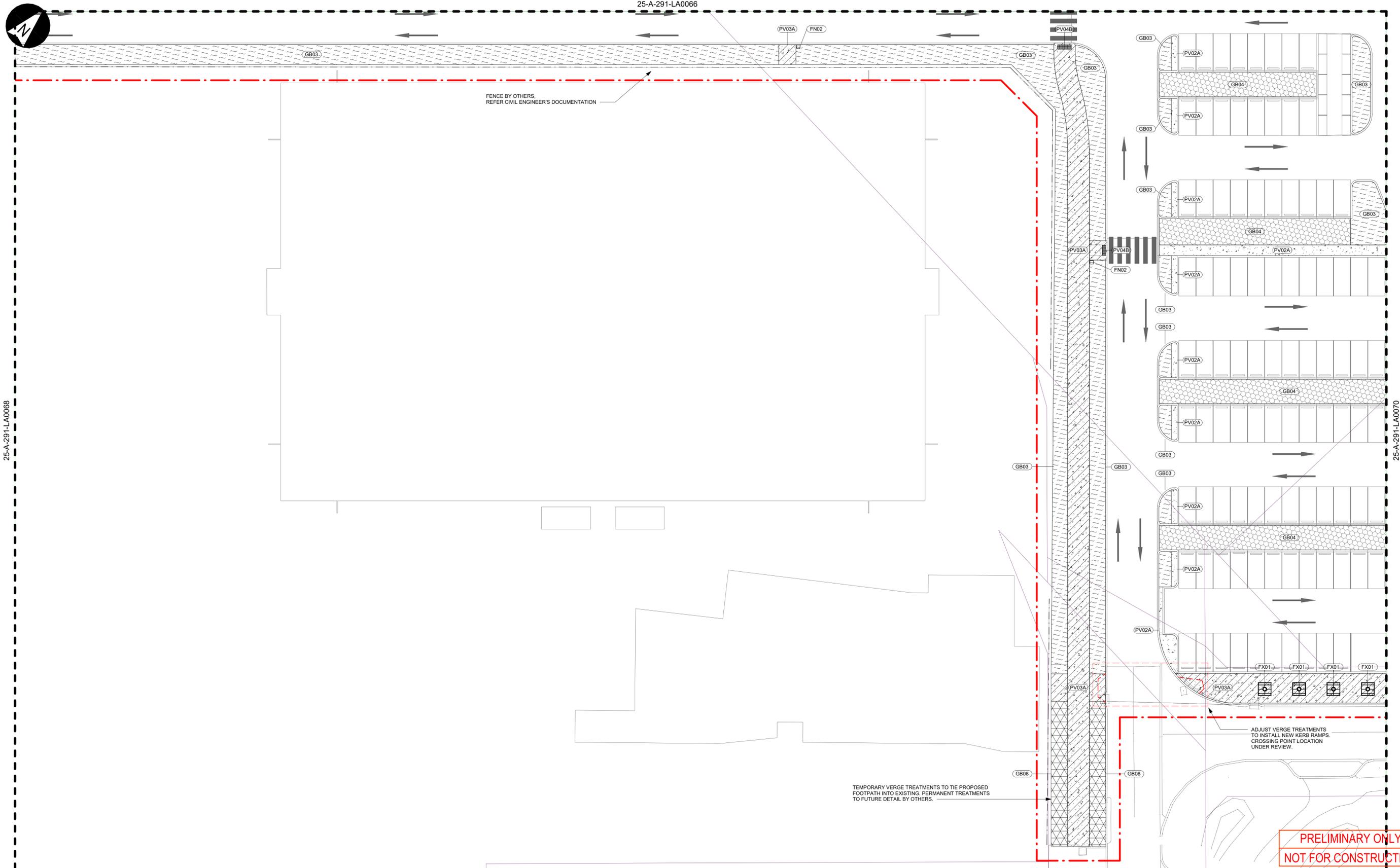
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VERTICAL:	AHD71
DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
GENERAL ARRANGEMENT & FINISHES PLAN

PTA Drawing No: 25-A-291-LA0068 Rev: A



25-A-291-LA0088

25-A-291-LA0070

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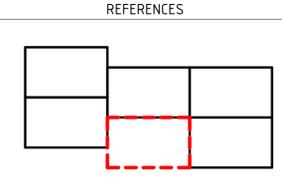
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NOT FOR CONSTRUCTION

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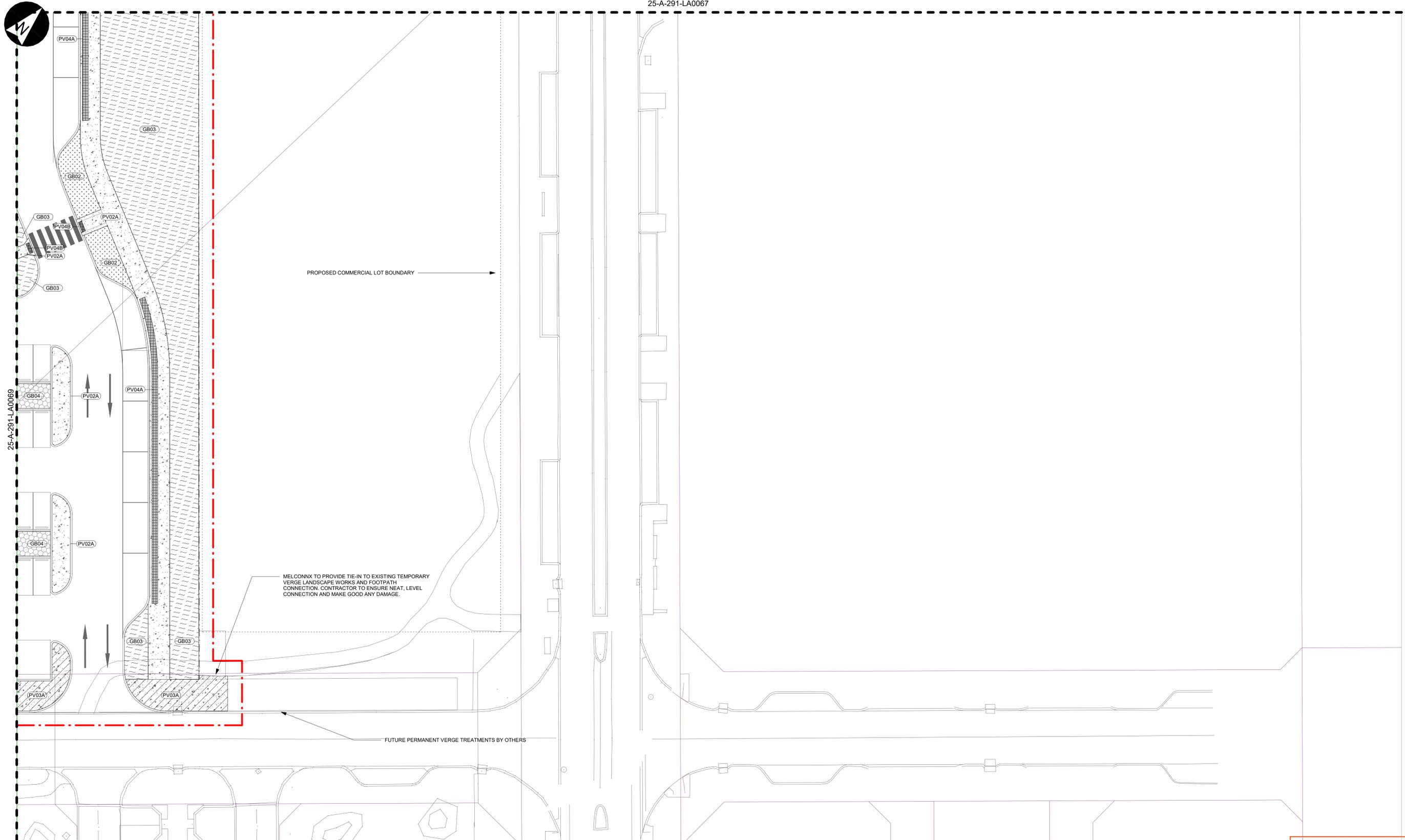
  

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SCALE	1 : 250 (@ A1)
DATUM	
HORIZONTAL:	PCG2020
VERTICAL:	AHD71
DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
GENERAL ARRANGEMENT & FINISHES PLAN	
PTA Drawing No: 25-A-291-LA0069	Rev: A



25-A-291-LA0069

1 25-A-291-LA0070  
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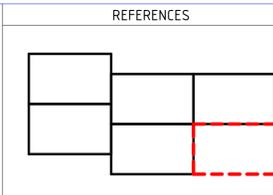
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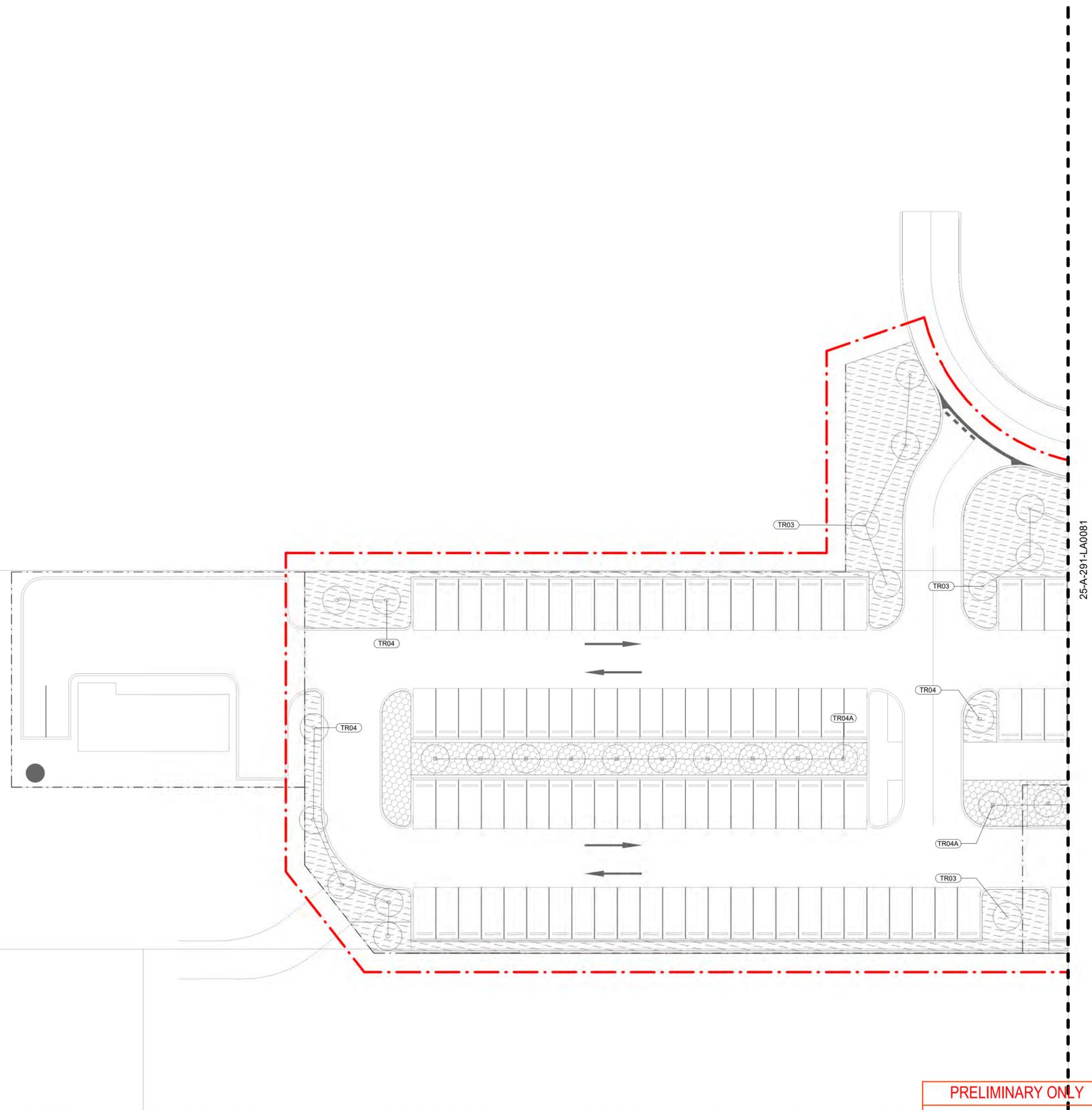
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DATUM	HORIZONTAL: PCG2020 VERTICAL: AHD71
DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE GENERAL ARRANGEMENT & FINISHES PLAN	
PTA Drawing No: 25-A-291-LA0070	Rev: A



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25-A-291-LA0083

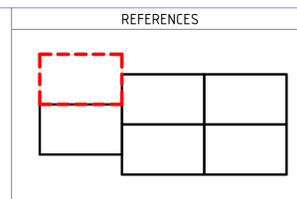
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Model Rev:REFERENCE DESIGN Issued:2021

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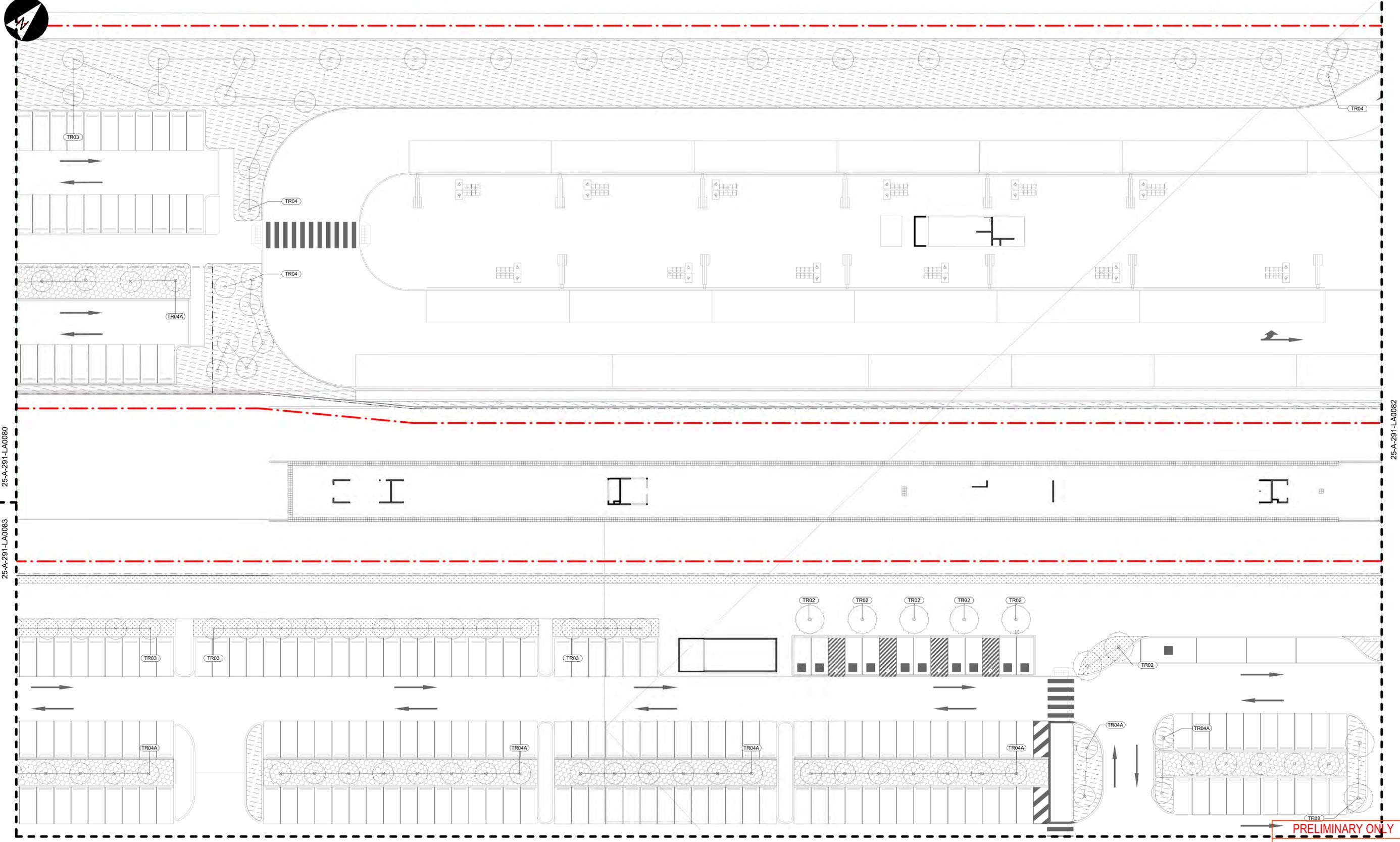
  

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SCALE	DESIGNED
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	DRAWN Jacob Conquer
	CHECKED Scott Lang
	APPROVED Manoj Aravind
	DATE 04/06/21

REFERENCES	DATUM	DESIGNED	PROJECT
	HORIZONTAL: PCG2020 VERTICAL: AHD71	UDLA & TCL	MORLEY ELLENBROOK LINE
			ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE
			PLANTING PLAN
			PTA Drawing No: 25-A-291-LA0080 Rev: A



25-A-291-LA0080

25-A-291-LA0083

25-A-291-LA0082

25-A-291-LA0084

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PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

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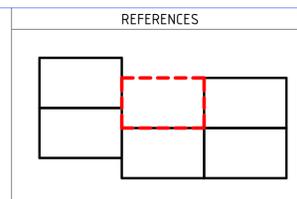
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ORIG SIZE	AT ORIGINAL PLOT SIZE
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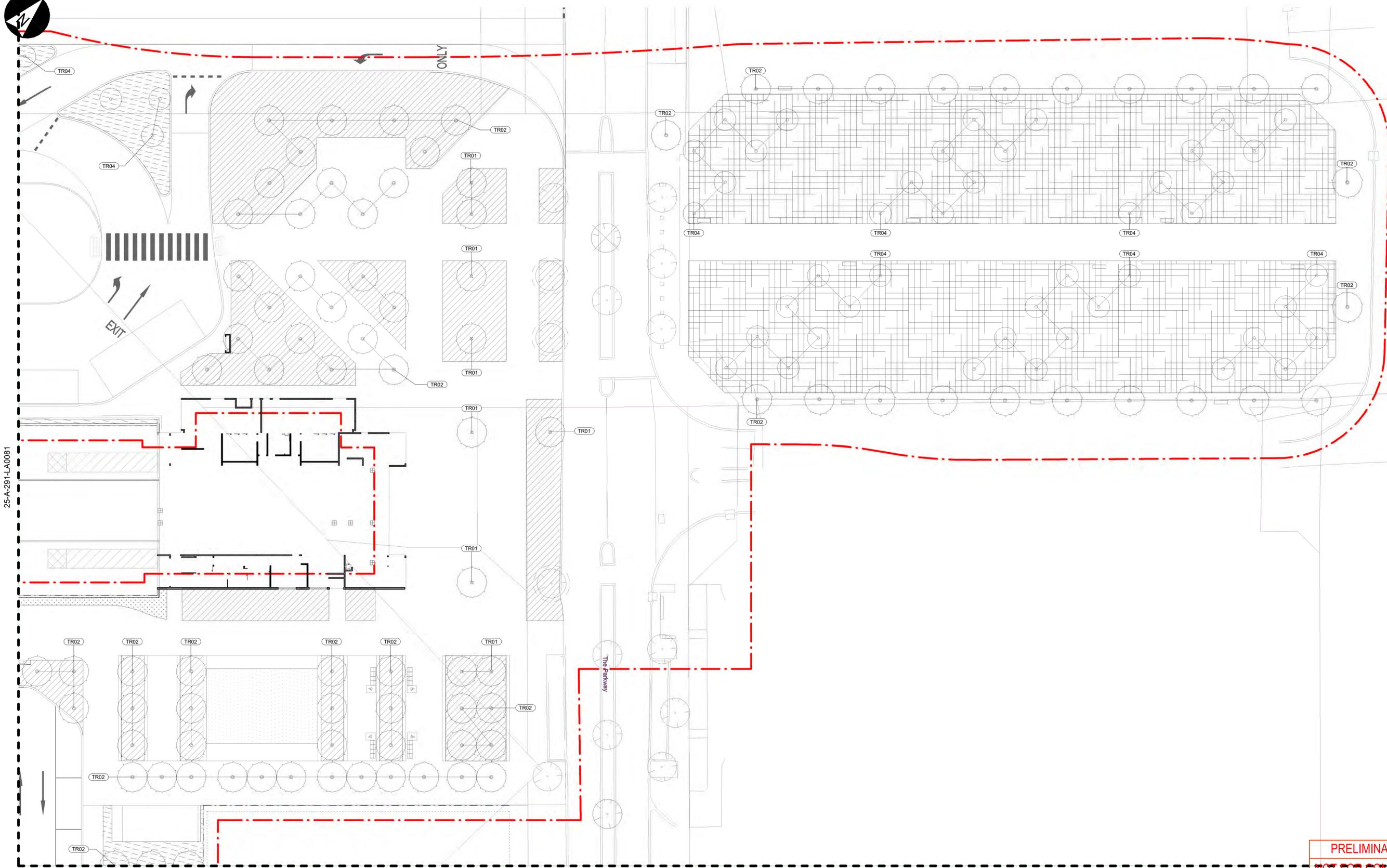
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VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
PLANTING PLAN

PTA Drawing No: 25-A-291-LA0081 Rev: A



25-A-291-LA0081

25-A-291-LA0085

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

1 25-A-291-LA0082  
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Model Rev:REFERENCE DESIGN Issued:2021

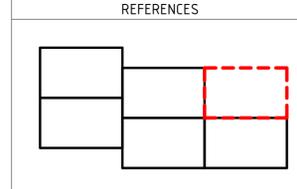
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ORIG SIZE	A1	AT ORIGINAL PLOT SIZE
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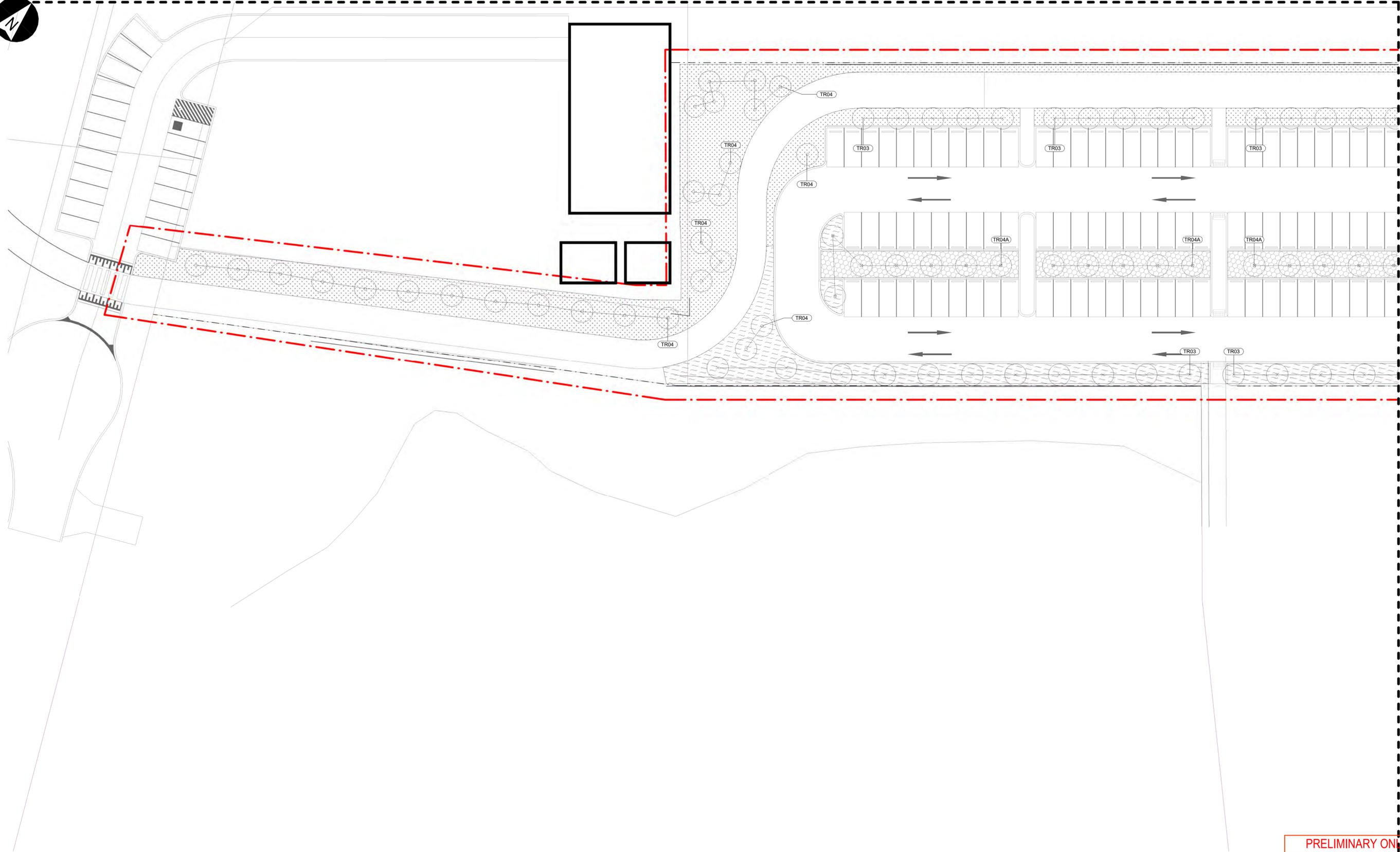
  

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DATUM	HORIZONTAL: PCG2020 VERTICAL: AHD71
DESIGNED	UDLA & TCL
DRAWN	Jacob Conquer
CHECKED	Scott Lang
APPROVED	Manoj Aravind
DATE	04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
PLANTING PLAN	
PTA Drawing No: 25-A-291-LA0082	Rev: A



25-A-291-LA0084

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PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

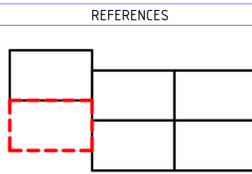
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ORIG SIZE	SCALE	NOTES
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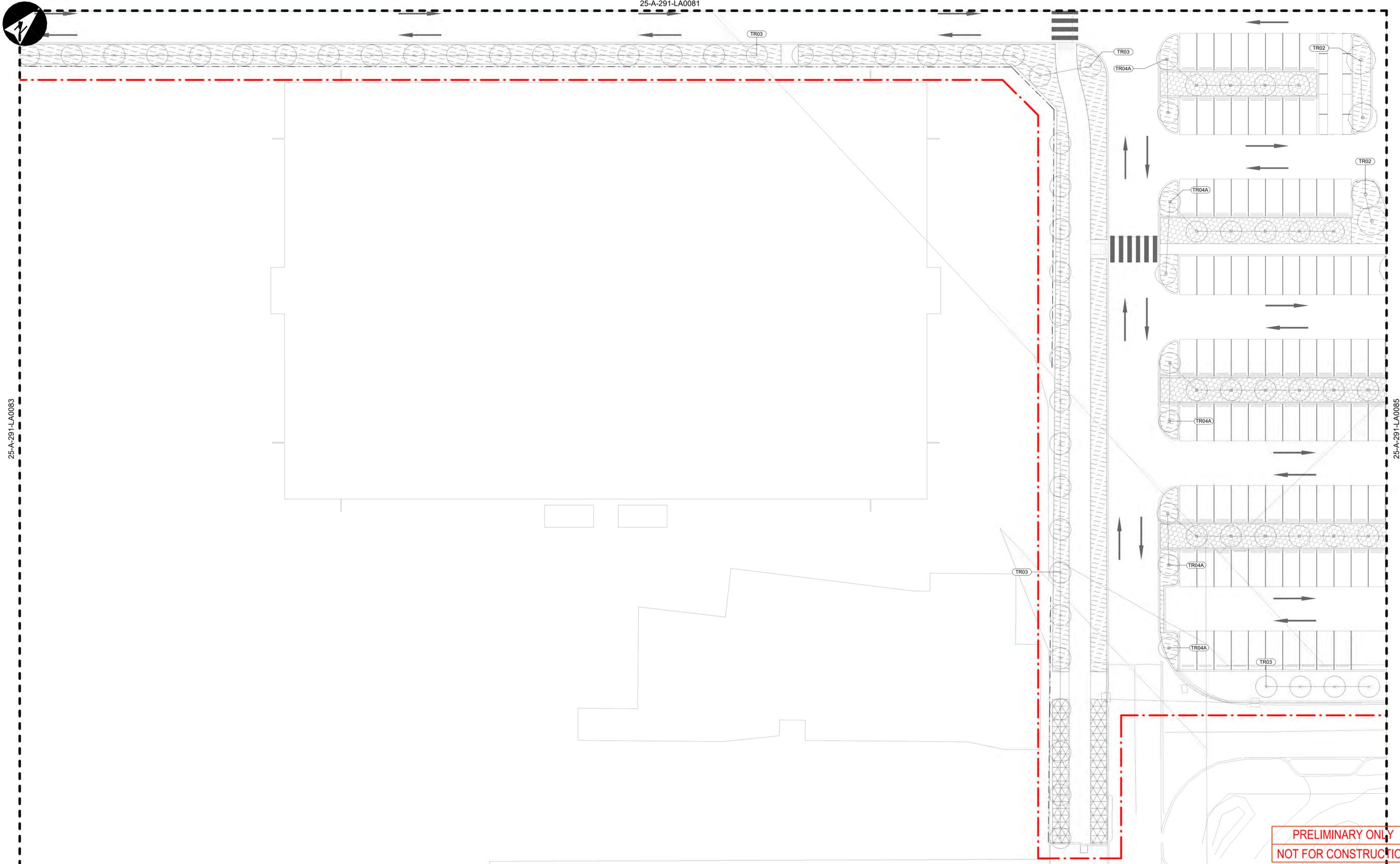
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DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
PLANTING PLAN

PTA Drawing No: 25-A-291-LA0083 Rev: A

25-A-291-LA0081



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NOT FOR CONSTRUCTION

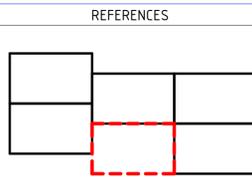
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ORIG SIZE	SCALE	NOTES
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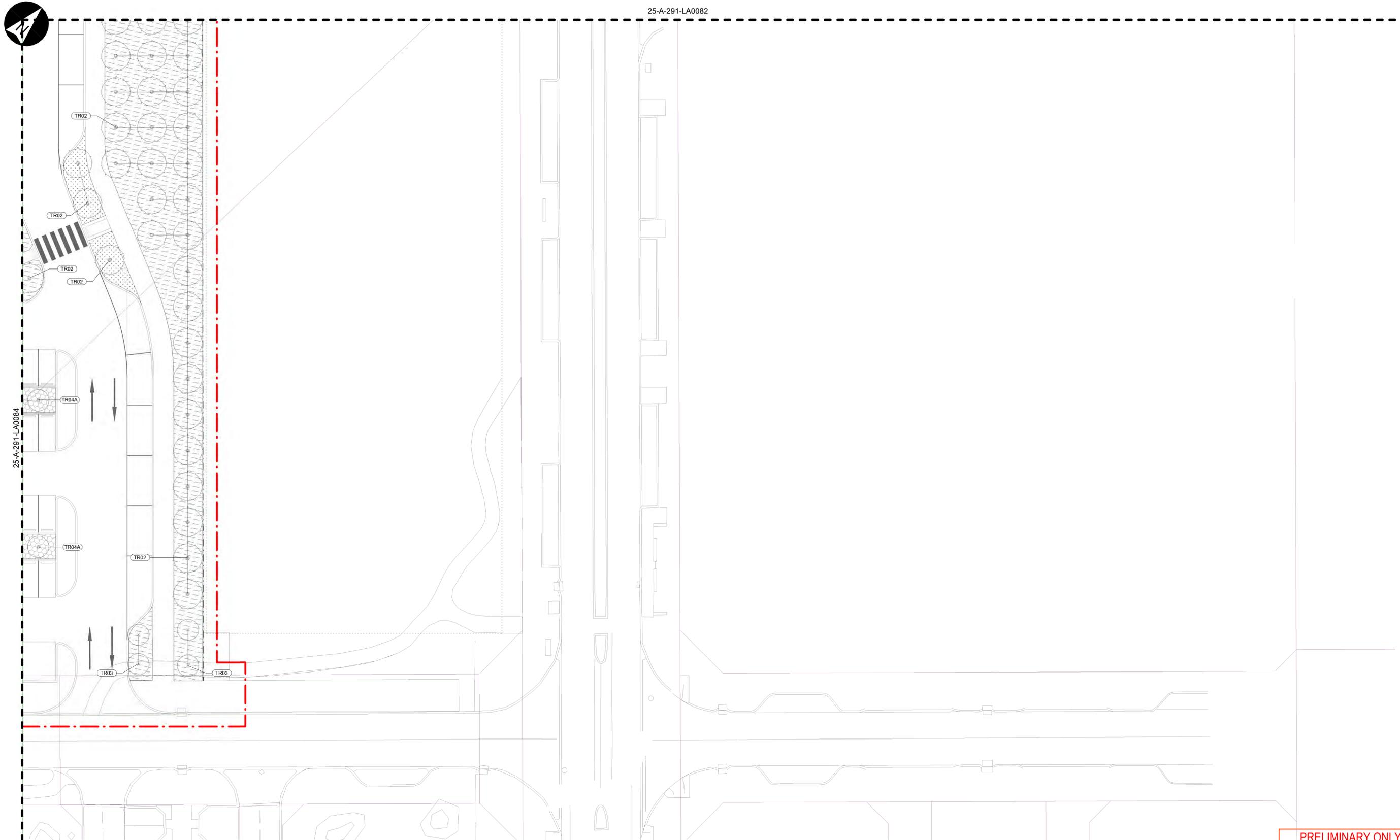
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HORIZONTAL: PCG2020  
VERTICAL: AHD71

DESIGNED UDLA & TCL  
DRAWN Jacob Conquer  
CHECKED Scott Lang  
APPROVED Manoj Aravind  
DATE 04/06/21

Government of Western Australia  
Public Transport Authority

MORLEY ELLENBROOK LINE  
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
PLANTING PLAN

PTA Drawing No: 25-A-291-LA0084 Rev: A



1 25-A-291-LA0085  
1 : 250

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

Model Rev:REFERENCE DESIGN Issued:2021

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

ORIG SIZE	A1	AT ORIGINAL PLOT SIZE
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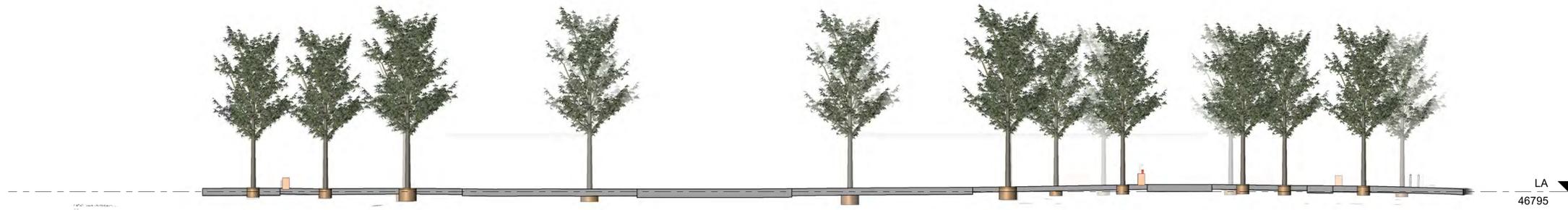
  

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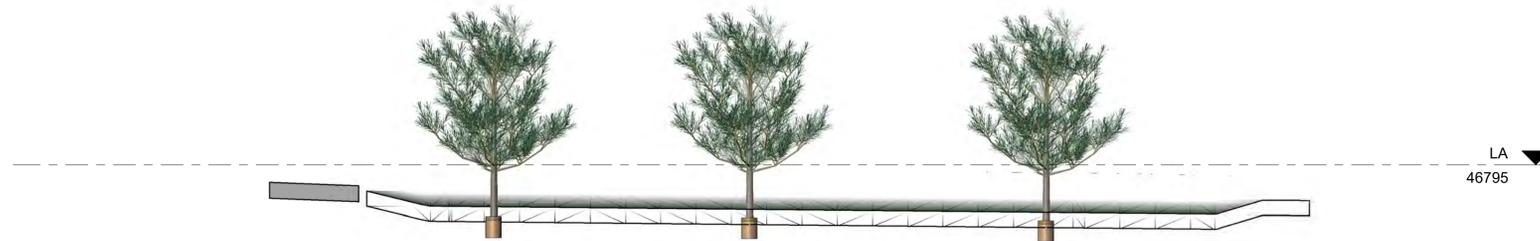


REFERENCES	SCALE	DESIGNED
	1 : 250 (@ A1)	UDLA & TCL
		DRAWN Jacob Conquer
		CHECKED Scott Lang
		APPROVED Manoj Aravind
		DATE 04/06/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
PLANTING PLAN	
PTA Drawing No: 25-A-291-LA0085	Rev: A



1 Section 1  
1 : 200



2 Section 2  
1 : 100

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	UDLA	JC	CT	SL
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DSN	DRN	CHK	APP			
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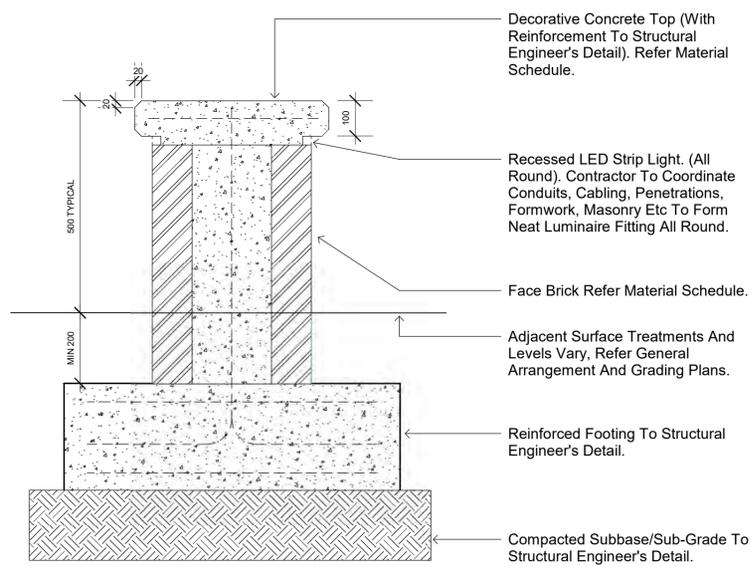
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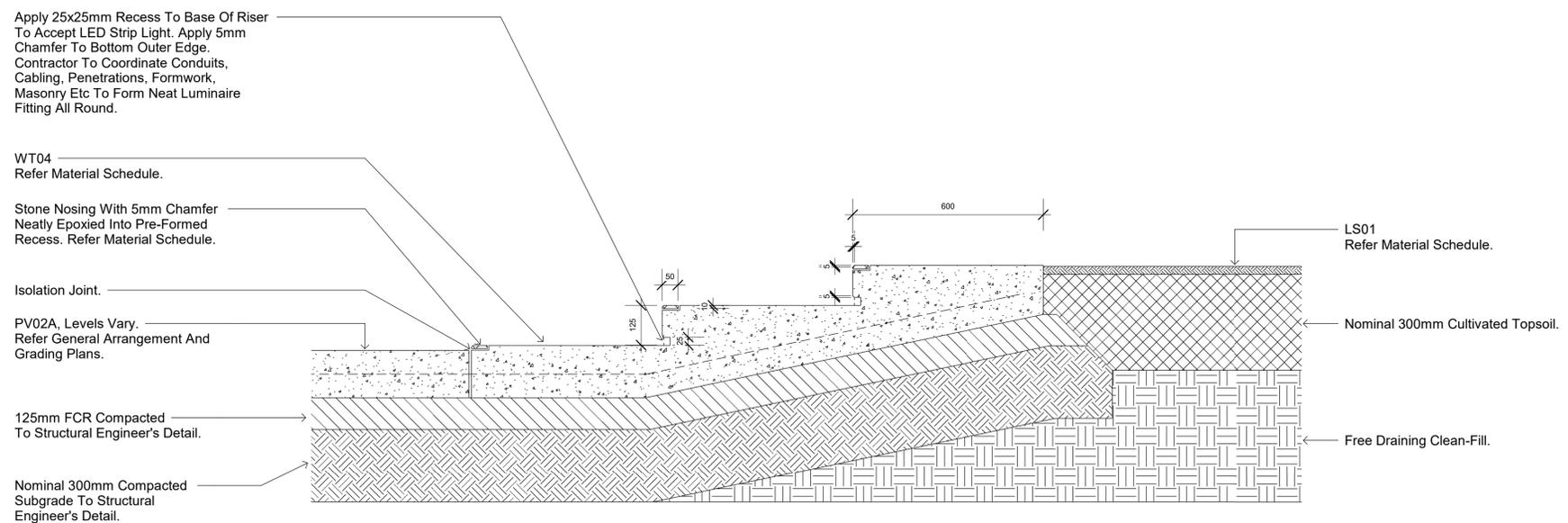


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	DATUM HORIZONTAL: PCG2020 VERTICAL: AHD71	DRAWN Author
		CHECKED Checker
		APPROVED Approver
		DATE 29/04/21

	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
LANDSCAPE SECTIONS/ELEVATIONS	
PTA Drawing No: 25-A-291-LA0105	Rev: A01



1 WT01  
1 : 10



2 WT04  
1 : 10

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

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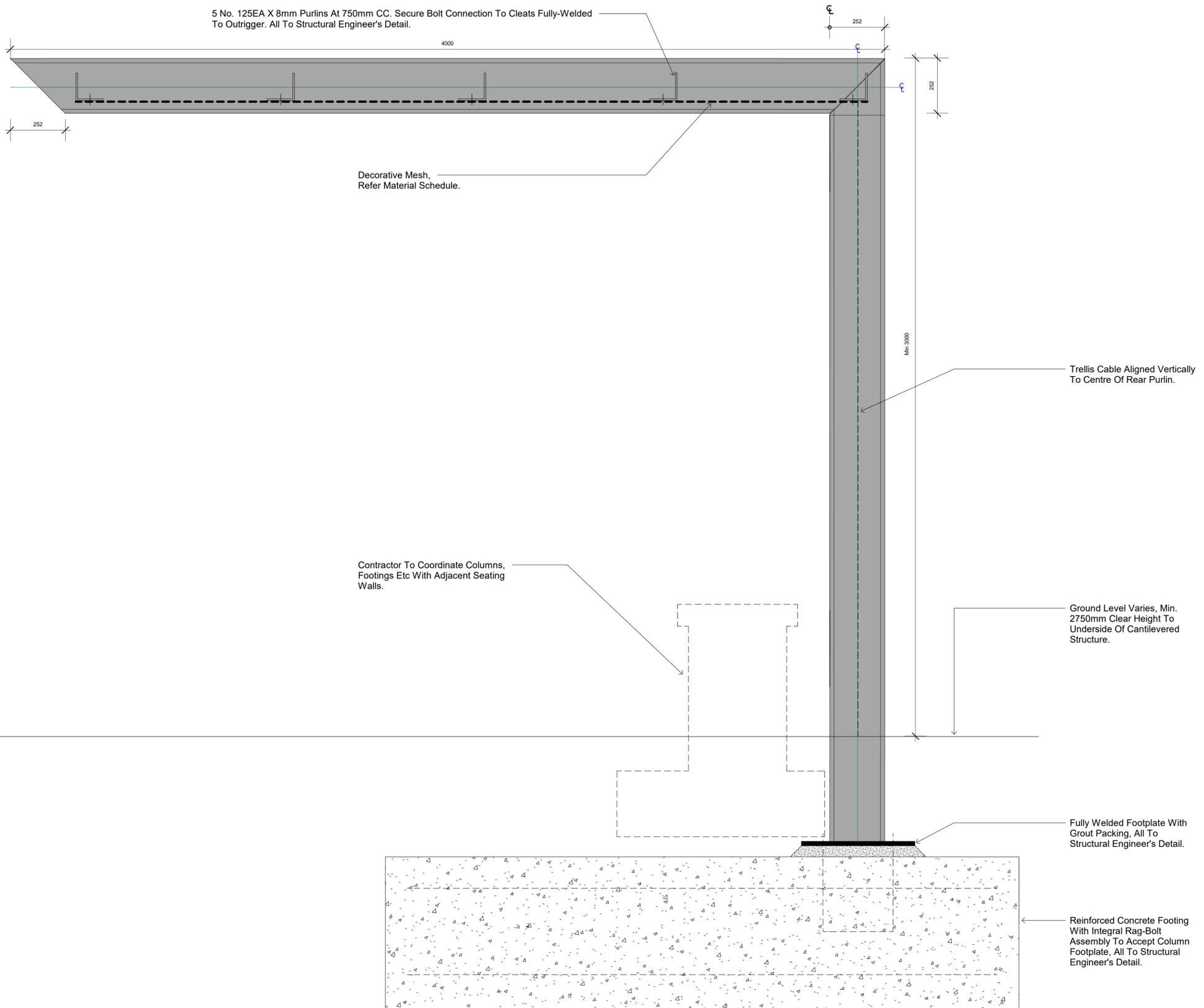
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REFERENCES	SCALE	DESIGNED
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		DRAWN Jacob Conquer
		CHECKED Scott Lang
		APPROVED Manoj Aravind
		DATE 04/06/21

	<b>MORLEY ELLENBROOK LINE</b> <b>ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE</b> <b>LANDSCAPE DETAILS - WALLS</b>
PTA Drawing No: 25-A-291-LA0115	Rev: A



PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

1 CA01  
1 : 10

REV	DATE	AMENDMENT	UDLA	JC	SL	MA
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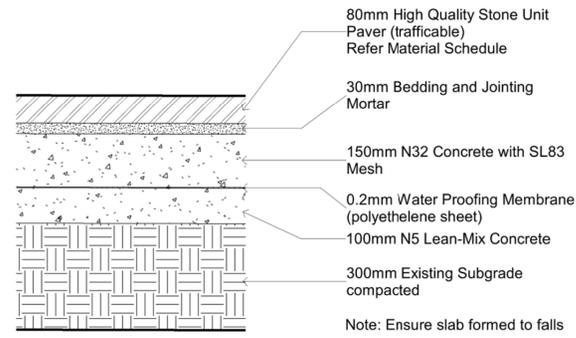
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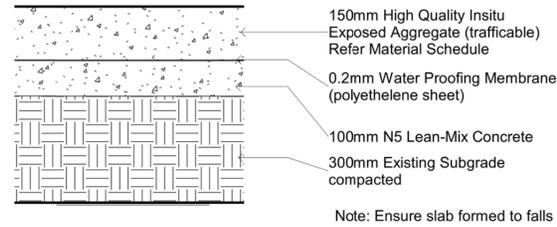


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	HORIZONTAL: PCG2020	CHECKED Scott Lang
	VERTICAL: AHD71	APPROVED Manoj Aravind
		DATE 04/06/21

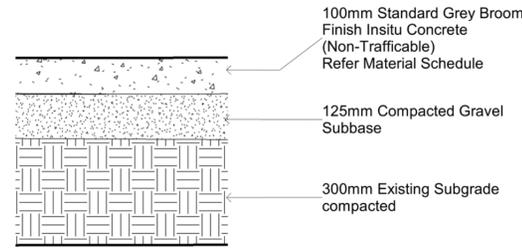
Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
LANDSCAPE DETAILS - ARBOUR	
PTA Drawing No: 25-A-291-LA0116	Rev: A



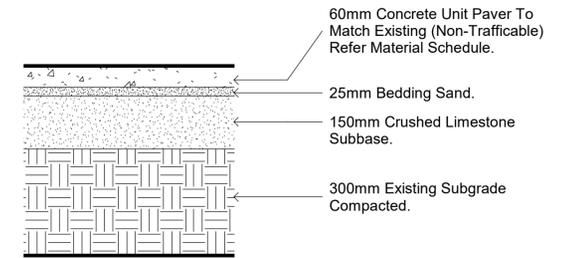
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1 : 10



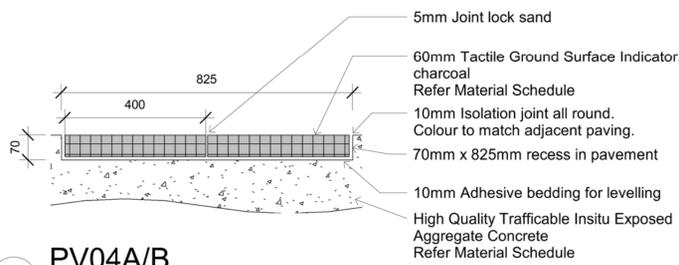
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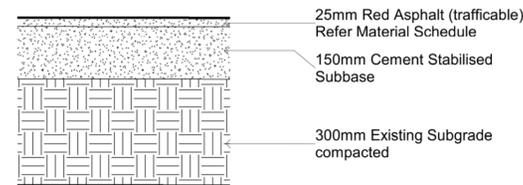
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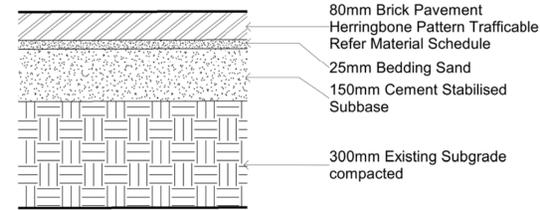
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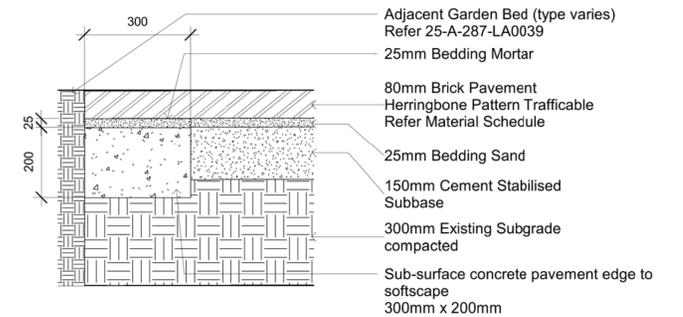
5 PV04A/B  
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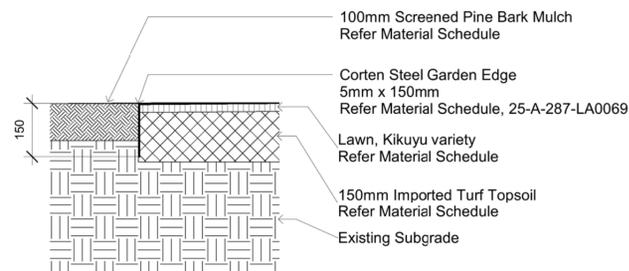
6 PV05A  
1 : 10



7 PV08A  
1 : 10



8 ED04A  
1 : 10



9 ED06  
1 : 10

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

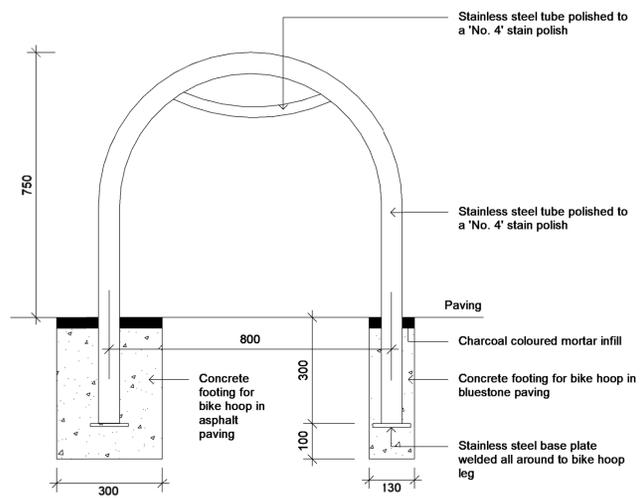
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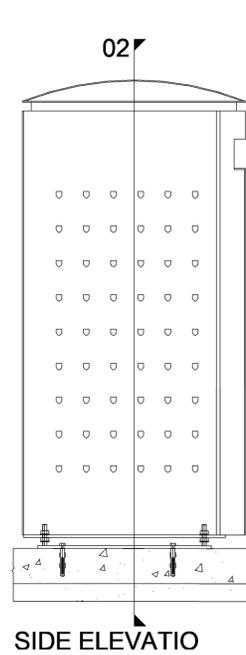


REFERENCES	SCALE	DESIGNED
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		DRAWN Jacob Conquer
		CHECKED Scott Lang
		APPROVED Manoj Aravind
		DATE 04/06/21

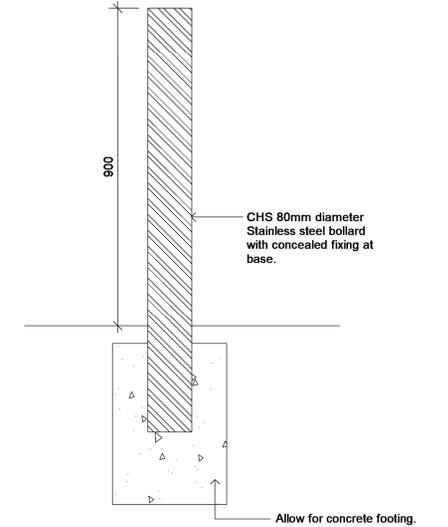
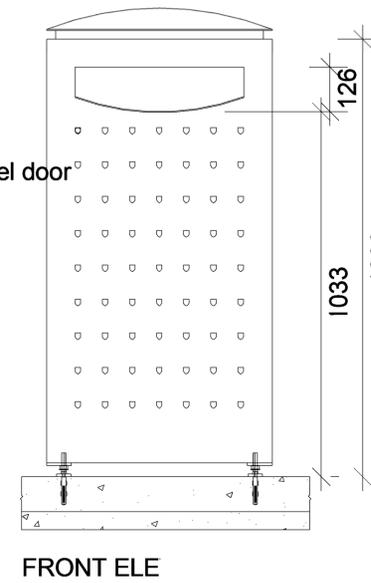
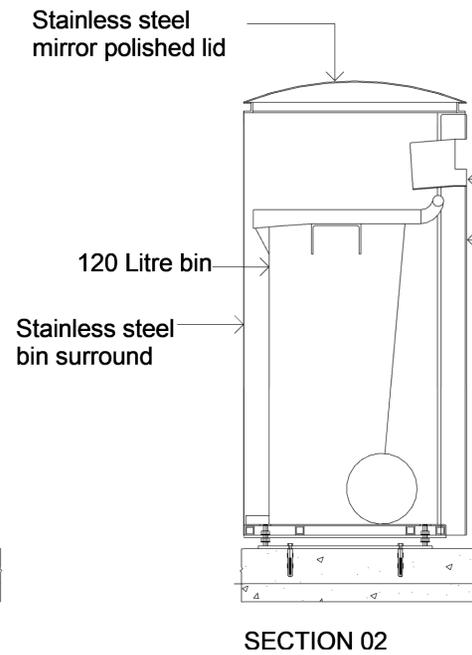
Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
LANDSCAPE DETAILS - PAVEMENTS	
PTA Drawing No: 25-A-291-LA0118	Rev: A



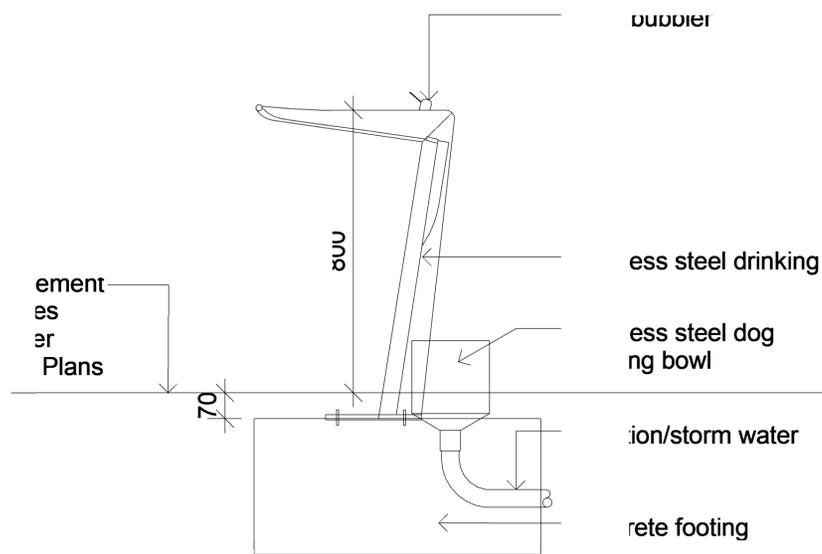
1 FN01  
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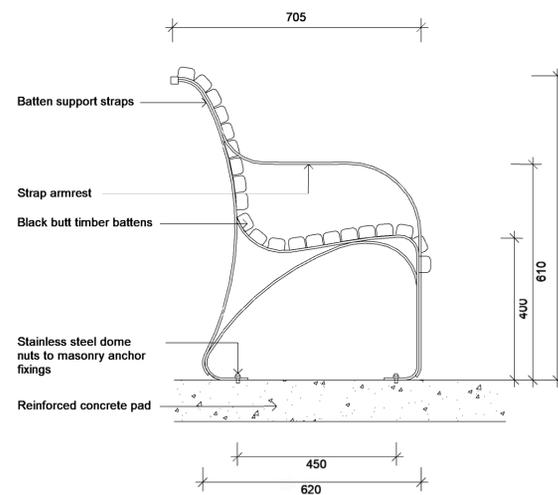
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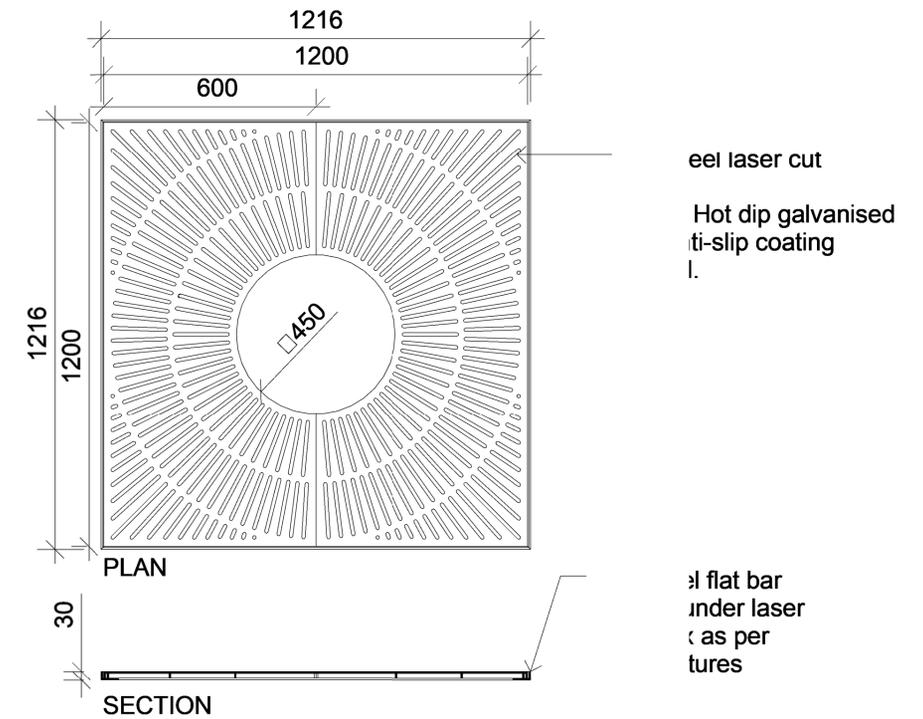
5 FX02  
1 : 10



3 FN03  
1 : 10



4 FN04  
1 : 10



6 FX01  
1 : 10

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A02	29/04/21	Issue for RD-IDC	UDLA	JC	CT	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	CT	SL

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

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REFERENCES

SCALE

1 : 10 (@ A1)

DATUM

HORIZONTAL: PCG2020

VERTICAL: AHD71

DESIGNED UDLA & TCL

DRAWN Jacob

CHECKED Conquer

APPROVED Carl

Carl Thompson

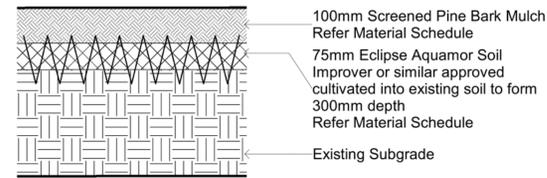
DATE 29/04/21

Government of Western Australia  
Public Transport Authority

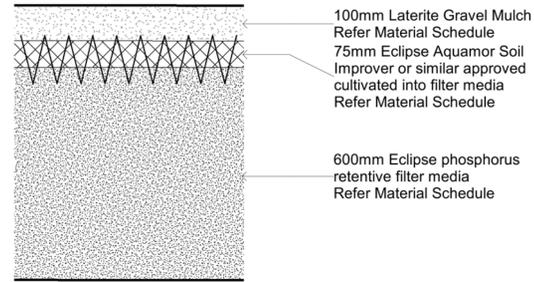
MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
LANDSCAPE DETAILS - FURNITURE

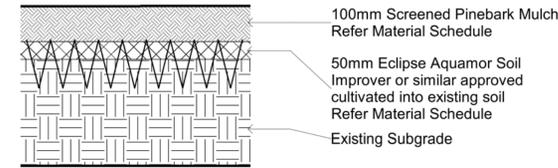
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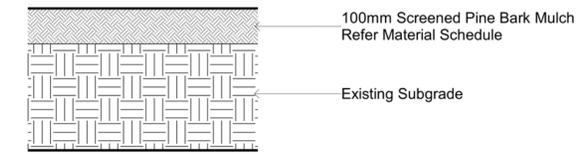
1 GB01, GB02, GB03  
1 : 10



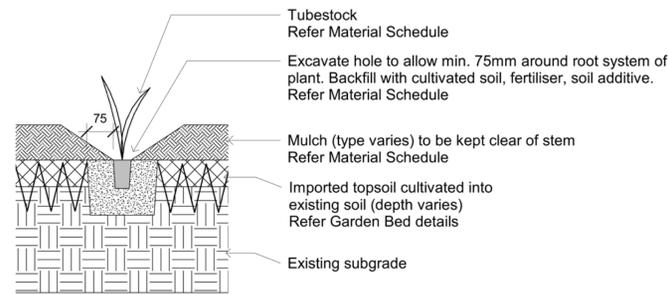
2 GB04B, GB04C  
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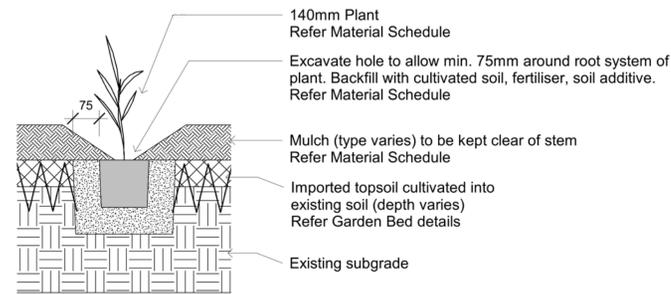
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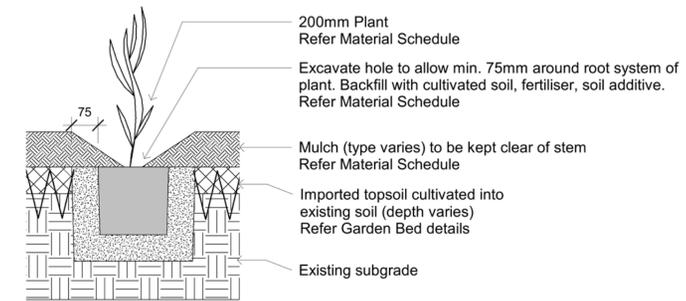
4 GB08  
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5 50mm Tubestock  
1 : 10



6 140mm Pot  
1 : 10



7 200mm Pot  
1 : 10

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

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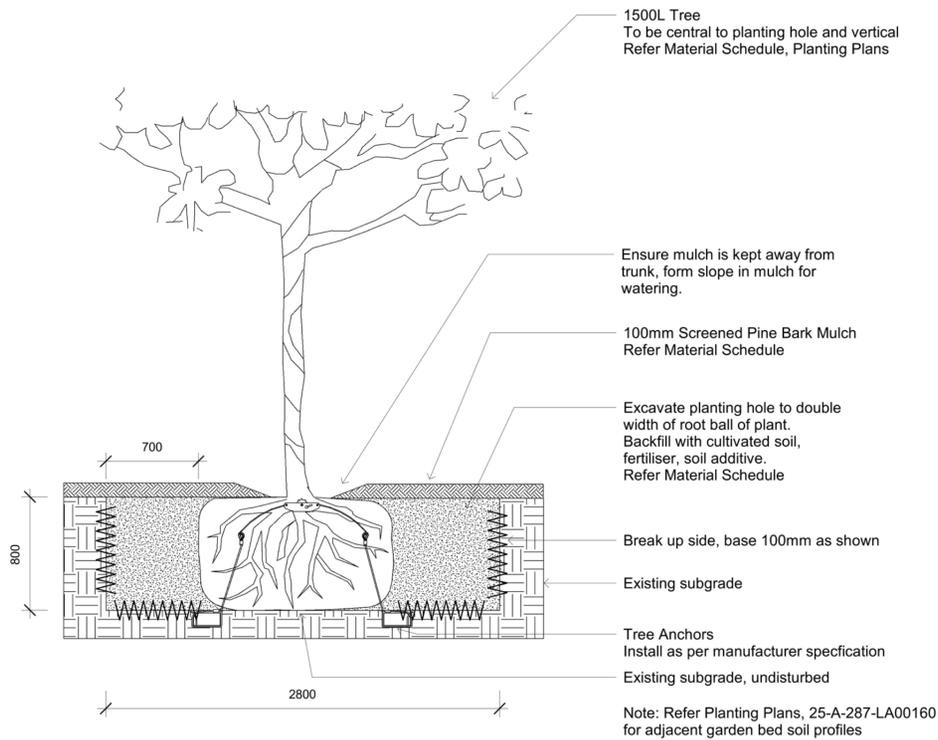
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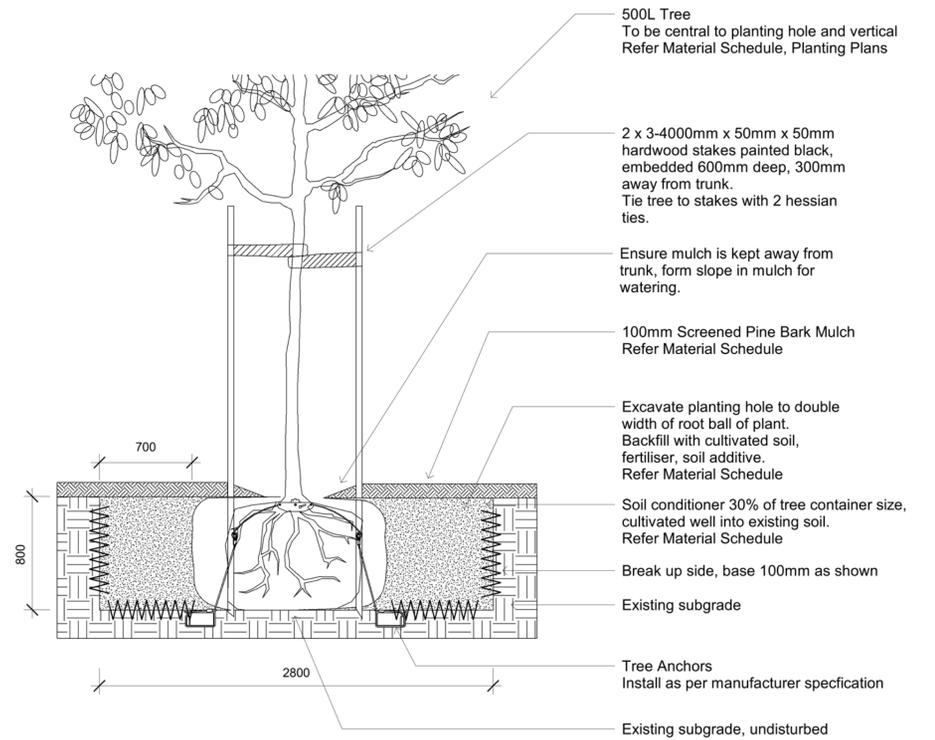


REFERENCES	SCALE	DESIGNED
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		DRAWN Jacob Conquer
		CHECKED Scott Lang
		APPROVED Manoj Aravind
		DATE 04/06/21

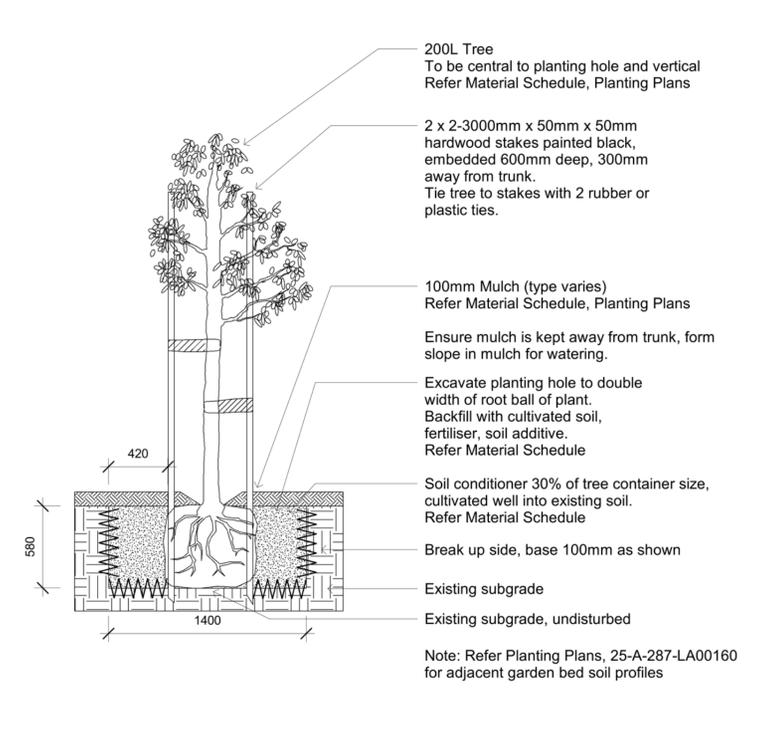
Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
LANDSCAPE DETAILS - SOFTSCAPE	
PTA Drawing No: 25-A-291-LA0160	Rev: A



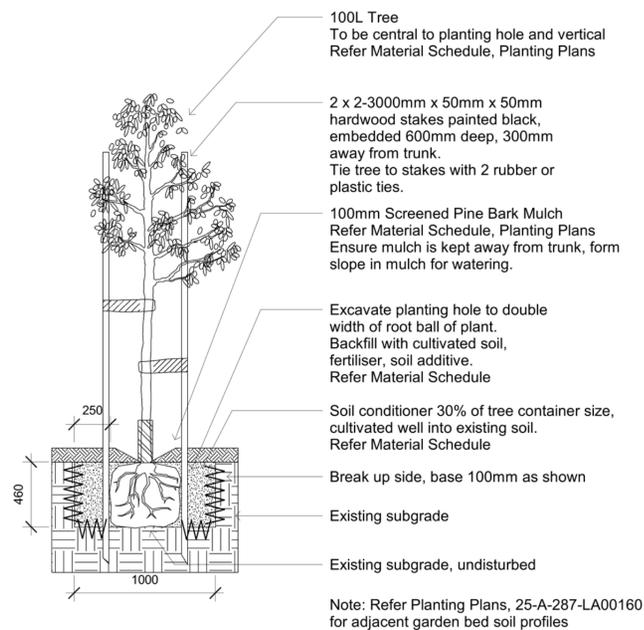
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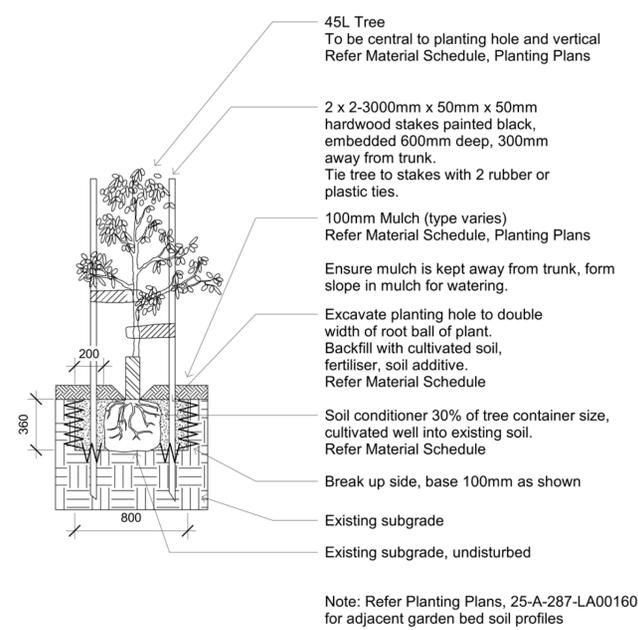
2 TR02  
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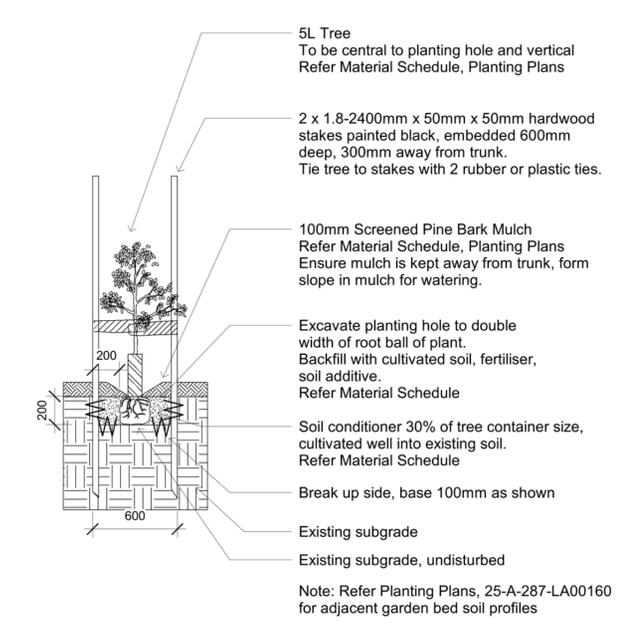
3 TR03  
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4 TR04, TR04A  
1 : 25



5 TR05  
1 : 25



6 TR06  
1 : 25

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	04/06/21	Issue for Reference Design	UDLA	JC	SL	MA
A02	29/04/21	Issue for RD-IDC	UDLA	JC	SL	SL
A01	29/03/21	Issue for 50% RD	UDLA	JC	SL	SL

ORIG SIZE: A1  
AT ORIGINAL PLOT SIZE

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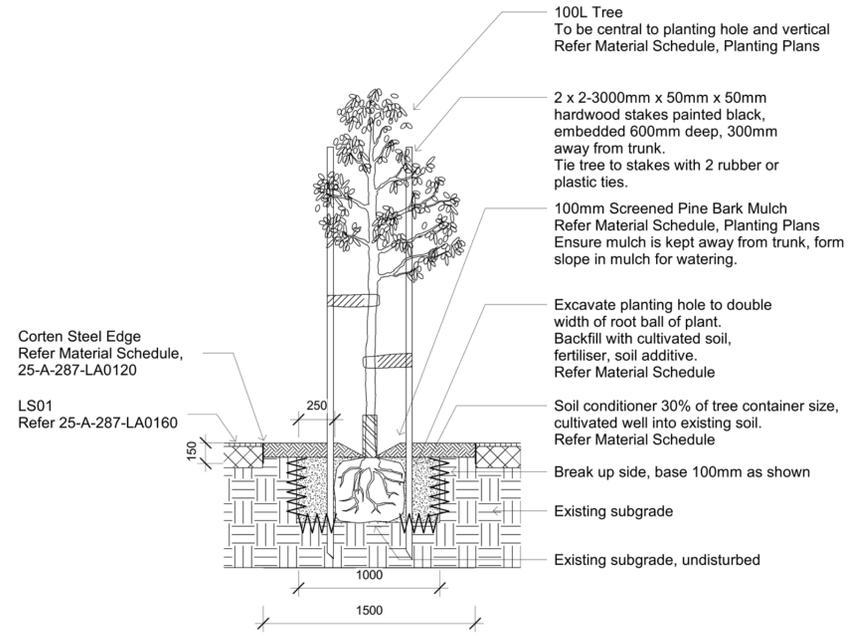
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		CHECKED: Scott Lang
		APPROVED: Manoj Aravind
		DATE: 04/06/21

Government of Western Australia  
Public Transport Authority

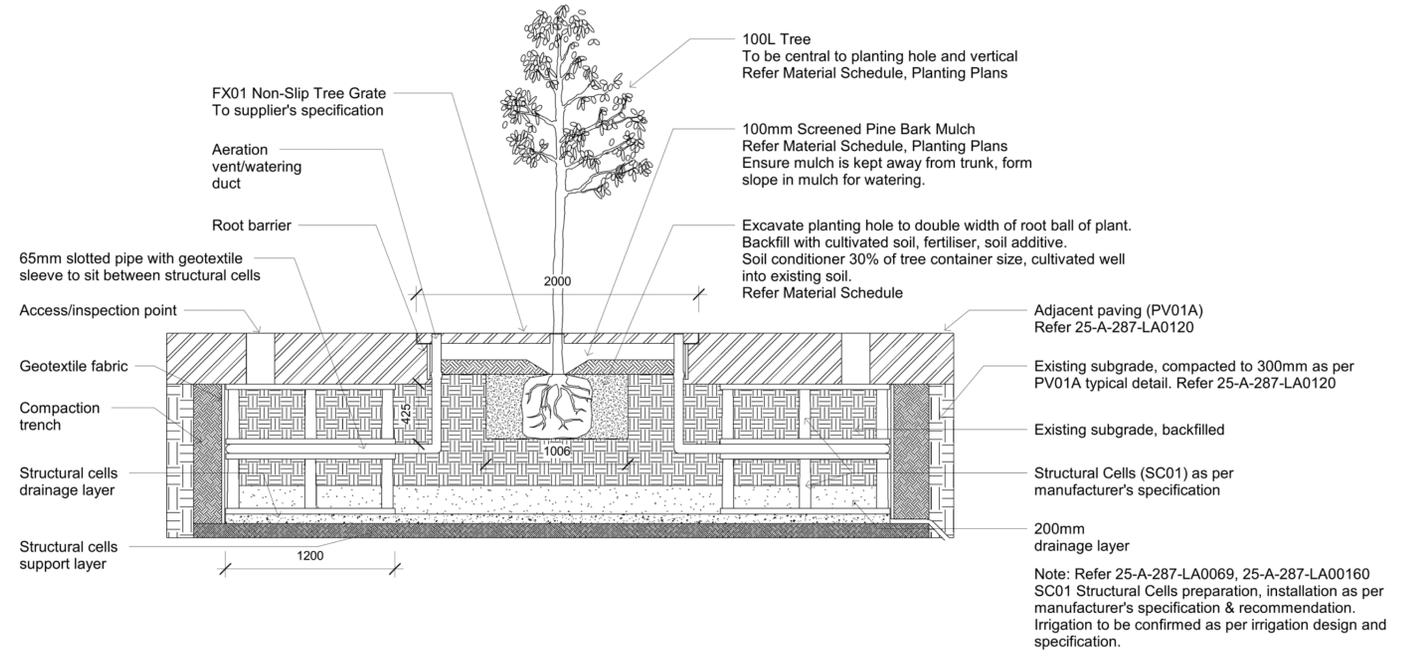
MORLEY ELLENBROOK LINE

ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE  
LANDSCAPE DETAILS - SOFTSCAPE

PTA Drawing No: 25-A-291-LA0161 Rev: A



1 TR04 in Turf  
1 : 25



2 SC01  
1 : 25

PRELIMINARY ONLY  
NOT FOR CONSTRUCTION

REV	DATE	AMENDMENT	UDLA	JC	SL	MA
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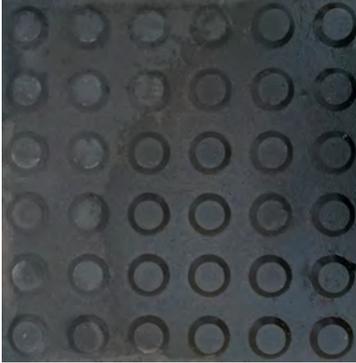
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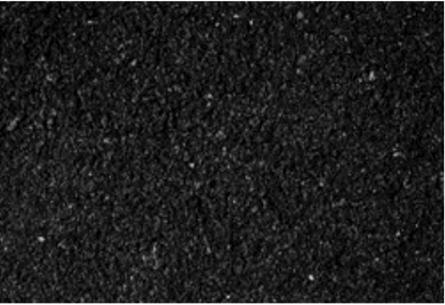
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	DATUM	DRAWN
	HORIZONTAL: PCG2020	Jacob Conquer
	VERTICAL: AHD71	CHECKED
		Scott Lang
		APPROVED
		Manoj Aravind
		DATE
		04/06/21

Government of Western Australia Public Transport Authority	MORLEY ELLENBROOK LINE
ELLENBROOK STATION - LANDSCAPE - ARCHITECTURE	
LANDSCAPE DETAILS - SOFTSCAPE	
PTA Drawing No: 25-A-291-LA0162	Rev: A

ELLENBROOK STATION PRECINCT LANDSCAPE WORKS				DOC REV: A	DOC NO: MEL-MLCX-LA-SCH-00001	
CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
PAVING						
PV01A	Station Entry - Welcome Place	High Quality Trafficable Stone Unit Paver	<p><u>Pavement Body</u>            Material: Natural Stone            Finish: Exfoliated            Size: 600mm x 400mm x 80mm            Colour: Austral Coffee            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Bedding: 25mm mortar base to engineer's detail            Slab: 150mm reinforced concrete slab to engineer's detail            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer: Urbanstone</p> <p><u>Pavement Header</u>            Material: Natural Stone            Finish: Exfoliated            Size: TBC (l) x TBC (w) x 80mm thk            Colour: Austral Coffee            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Bedding: 25mm mortar base to engineer's detail            Slab: 150mm reinforced concrete slab to engineer's detail            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer: Urbanstone</p>		<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A
PV02A	Station Welcome Place, Bus Port,	High Quality Trafficable Insitu Exposed Aggregate Concrete	<p>Material: Proprietary decorative concrete mix            Colour: Coogee            Finish: Exposed aggregate            Thickness: 200mm            Reinforcement: Nom. SL72, subject to engineer's detail            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Expansion Joints: Pinnable all-in-one Lock Joint, colour to match adjacent pavement.            Control Joints: Saw-cut            Vapour barrier: 0.2mm polyethylene            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer: Boral</p>		<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
PV03A	Secondary Spaces and Pathways	Concrete Unit Paver	<p><u>Pavement Body</u>  Material: Helenastone concrete unit paver  Finish: Stonewash  Size: 400 x 400 x 60mm  Colour: Grey  Pattern: Stretcher bond  Sub-base: 125mm FCR to engineer's detail  Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm  Manufacturer: Brikmakers</p> <p><u>Pavement Header</u>  Material: Helenastone concrete unit paver  Finish: Stonewash  Size: 190 x 190 x 60mm  Colour: Grey  Pattern: Stretcher bond  Sub-base: 125mm FCR to engineer's detail  Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm  Manufacturer: Brikmakers</p>		<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A
PV04A	Station Precinct Pram Ramps	Tactile Ground Surface Indicator Pavers - hazard indicator units	<p>Product: Brikmakers Helenastone concrete unit paver  Finish: As supplied  Size: 400 x 400 x 60mm  Colour: Charcoal  Pattern: Dot  Installation: Install in pre-formed kerb ramp rebates, refer civil eng. Detail. Where installed in paved areas, provide nom. 50mm concrete blinding slab and grout in place.  Manufacturer: Brikmakers</p>		<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
PV04B	Station Precinct Pram Ramps	Tactile Ground Surface Indicator Pavers - directional indicator units	Product: Brikmakers Helenastone concrete unit paver Finish: As supplied Size: 400 x 400 x 60mm Colour: Charcoal Pattern: T-Bar Installation: Install in pre-formed kerb ramp rebates, refer civil eng. Detail. Where installed in paved areas, provide nom. 50mm blinding slab and grout in place. Manufacturer: Brikmakers	Image TBC	<ol style="list-style-type: none"> <li>1. Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>2. Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>3. Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>4. Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>5. Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A
PV05A	PSP	Red Asphalt	Red Asphalt (Trafficable) Material: Integrally coloured, lateritic asphalt to engineer's specification Thickness: 75mm Sub-base: 2 x layers of 125mm FCR to engineer's detail Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm Manufacturer: Boral		<ol style="list-style-type: none"> <li>1. Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>2. Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>3. Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>4. Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>5. Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
PV06A		Black Asphalt	<p>Black Asphalt (Trafficable)</p> <p>Material: Integrally coloured, lateritic asphalt to engineer's specification</p> <p>Thickness: 75mm</p> <p>Sub-base: 2 x layers of 125mm FCR to engineer's detail</p> <p>Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm</p> <p>Manufacturer: Boral</p>		<ol style="list-style-type: none"> <li>1. Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>2. Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>3. Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>4. Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>5. Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage).</li> </ol>	A
PV07A	Village Common	Cement stabilised granitic gravel	<p>Material: Summerstone Fines</p> <p>Thickness: 100mm</p> <p>Compaction: To engineer's detail, nom. 8 Blows PSP to 300mm</p> <p>Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm</p> <p>Acceptable Supplier: Creation Landscape Supplies</p>		<ol style="list-style-type: none"> <li>1. Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>2. Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>3. Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>4. Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>5. Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage).</li> </ol>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
PV08A	Station Welcome Place (Ellenbrook)	Brick Pavement	<p><u>Pavement Body</u>  Product: Brikmakers Easipave 80  Finish: As supplied.  Colour: Autumn Blend  Unit Size: 220 x 110 x 80mm  Bond: Stretcher  Sealant: No sealer.  Sub-base: 125mm FCR to engineer's detail  Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm  Manufacturer: Brikmakers</p> <p><u>Pavement Header</u>  Product: As per body pave.  Pattern: Laid as soldier course, perpendicular to adjacent surface (in accordance with SWTC Book 4, Clause 10.4.10-16)  Manufacturer: Brikmakers</p>	 <p><i>Note: Stretcher bond to be used, no image of Autumn Blend available in stretcher bond at time of writing.</i></p>	<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A
PV08B	Station Welcome Place (Ellenbrook)	Brick Pavement	<p><u>Pavement Body</u>  Product: Brikmakers Easipave 80  Finish: Stonewash  Colour: Silver  Unit Size: 220 x 110 x 80mm  Bond: Herringbone  Sealant: No sealer.  Sub-base: 125mm FCR to engineer's detail  Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm  Manufacturer: Brikmakers</p> <p><u>Pavement Header</u>  Product: As per body pave.  Pattern: Laid as soldier course, perpendicular to adjacent surface (in accordance with SWTC Book 4, Clause 10.4.10-16)  Manufacturer: Brikmakers</p>		<ol style="list-style-type: none"> <li>Coordinate set-out, levels, grades and installation of FX01 (tree grates) and all service pit lids prior to installation of pavements to ensure flush interface of all adjacent hard surface and free draining surfaces.</li> <li>Ensure free-draining surfaces fall away from buildings, structures, furniture, stairs, ramps and landings.</li> <li>Comply with AS1428 tolerances for walkable surfaces. Any inconsistencies to be referred to the project landscape architect for review and determination.</li> <li>Provide expansion isolation joints between hard surfaces of different type, including between pavements, walls, structures and furniture.</li> <li>Refer to surface finishes plans for pavement jointing arrangements (TBC in future project stage). Nom. control joints at max. 2m spacings, expansion joints at max. 6m spacings.</li> </ol>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
WALL FINISHES AND CLADDING						
WT01	Welcome Place Seating Walls	Brick Clad Seat Wall with Concrete Top	<p><u>General</u>  Type: Double-leaf, reinforced, concrete cavity filled brick wall  Dimensions: H: 500mm above ground typ. W: 450mm L: Varies, refer drawings  Cover to footing: Nom. 200mm  Joints (movement): To future engineer's detail</p> <p><u>Concrete Top</u>  Material: To match PV02A.  Finish: Honed  Class: 1  Colour: As supplied.  Dimension: L Varies, W 500mm, 125mm thick  Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats  Lighting: Concealed LED strip lighting (spec TBC) to be integrated into concrete capping.  Allow for: Reinforcing, caulking and movement joints. Recess and installation of LED lighting strip to full perimeter of capping, incl. electrical connections etc.  Lighting requirements / spec. TBC.  Manufacturer: Boral</p> <p><u>Brick</u>  Material: TBC - Face clay brick To match station architectural selection  Colour: Heritage red / Terracotta colouring  Dimension: To match station architectural selection  Mortar: Class M3 and M4  Mortar colour: TBC  Mortar profile - Rolled (concave)  Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats  Manufacturer: Midland Brick / Brikmakers (TBC)</p> <p><u>Footing</u>  Class 4 finish, reinforced, standard grey concrete, nom. 300mm (d) x 900mm (w) x length varies. Footing to extend nom. 200mm beyond wall face in all directions.  Specification to structural engineer's detail.  Manufacturer: TBC</p>	 <p>The top image shows a close-up of red and terracotta bricks laid in a traditional pattern. The bottom image shows a close-up of a concrete surface with coarse, multi-colored aggregate exposed.</p>	1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
WT02	Place-Holder Only - Item not currently used	Brick Seating Wall	<p>Brick Seating Wall - To match existing in area.  Dimensions: L varies, W 450mm, H Varies.  Allow for: reinforcing, caulking and movement joints.  Feature Lighting: Allow for LED Strip lighting inset to all feature retaining walls within 'Welcome Place'.  Manufacturer - Concrete: Boral  Manufacturer - Brick: Midland Brick / Brikmakers (TBC)</p>		1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
WT04	Station Welcome Place Turf Edges	High Quality Insitu Concrete Steps	<p>Material: Proprietary decorative concrete mix  Colour: Coogee  Finish: Exposed aggregate  Thickness: 200mm  Riser dimension: Nom. 150mm  Tread dimension: Nom. 600mm  Stair width: Nom. 15,000mm  Reinforcement: Nom. SL72, subject to engineer's detail  Nosing: 10 x 50mm stone nosing for full width of stair, grouted into preformed rebate. Provide 5mm chamfer to top outer edge. Material - <i>Grigio Maha</i> ex. Bernini Stone  Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats  Lighting: Concealed LED strip lighting (spec TBC) to be integrated into recess at base of wall.  Allow for: Reinforcing, caulking and movement joints. Recess and installation of LED lighting strip to full perimeter to outer face, incl. electrical connections etc. Lighting requirements / spec. TBC.  Expansion Joints: Nom. 10mm Ableflex filler with mastic topping bead to match adjacent material colour. Max. 3m centres. Subject to engineer's detail.  Control Joints: Saw-cut  Vapour barrier: 0.2mm polyethylene  Sub-base: 125mm FCR to engineer's detail  Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm  Manufacturer: Boral</p>		1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
WT05	Station Welcome Place Turf Edges at Malaga Station	Insitu Concrete Seat Wall	<p>Material: To match PVO2A.  Finish: Honed  Class: 1  Colour: As supplied.  Dimension: L Varies, W 250mm, H Varies.  Reinforcement: To future engineer's detail.  Joints (movement): To future engineer's detail. Water stop detail required.  Additives: Xypex or approved similar water-proofing agent.  Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats  Lighting: Concealed LED strip lighting (spec TBC) to be integrated into recess at base of wall.  Allow for: Reinforcing, caulking and movement joints. Recess and installation of LED lighting strip to full perimeter to outer face, incl. electrical connections etc. Lighting requirements / spec. TBC.  Manufacturer - Concrete: Boral  Manufacturer - Lighting: TBC</p> <p><u>Footing</u>  Class 4 finish, reinforced, standard grey concrete, nom. 300mm (d) x 650mm (w) x length varies. Footing to extend nom. 200mm beyond wall face in all directions. Specification to structural engineer's detail.  Manufacturer - Concrete: Boral</p>		1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
WT06	Bus Port Maintenance Bays	Insitu Concrete Retaining Wall	<p>Material: Reinforced insitu concrete.            Finish: Off-form            Class: 2            Colour: Standard grey.            Dimension: L Varies, W 250mm, H Varies.            Reinforcement: To future engineer's detail.            Joints (movement): To future engineer's detail. Water stop detail required.            Additives: Xypex or approved similar water-proofing agent.            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Manufacturer - Concrete: Boral</p> <p><u>Footing</u>            Class 4 finish, reinforced, standard grey concrete, nom. 300mm (d) x 650mm (w) x length varies. Footing to extend nom. 200mm beyond wall face in all directions.            Specification to structural engineer's detail.            Manufacturer - Concrete: Boral</p>		1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
GARDEN EDGES						
ED01	Garden Edges in Welcome Place / Level 2 & 3 Investment Zones (excludes civil kerbs, refer civil engineer's documentation)	High Quality Softscape Maintenance Edge (between turf and garden beds)	<p>Material: Insitu concrete            Finish: Exposed Aggregate            Colour: To match PVO2A            Dimension: 200mm x 200mm, length varies            Reinforcement: Nom. 2 x N16 rods vertically central, 50mm cover - subject to engineer's detail            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Expansion Joints: Ableflex expansion foam fill with mastic topping bead to vertical sides and top at 6m centres, colour to match adjacent pavement.            Control Joints: Saw-cut at 2m centres.            Vapour barrier: 0.2mm polyethylene            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer - Concrete: Boral</p>	TBC	1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
ED02	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	Standard Softscape Maintenance Edge (between turf and garden beds)	<p>Material: Insitu concrete            Finish: Smooth, steel trowel            Colour: Standard grey            Dimension: 200mm x 200mm, length varies            Nom. 2 x N16 rods vertically central, 50mm cover - subject to engineer's detail            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Expansion Joints: Ableflex expansion foam fill with mastic topping bead to vertical sides and top at 6m centres, colour to match adjacent pavement.            Control Joints: Saw-cut at 2m centres.            Vapour barrier: 0.2mm polyethylene            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer - Concrete: Boral</p>	TBC	1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
ED03	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	High Quality Unit Pavement Restraint Edge (Surface visible, between pavement and softscape)	<p>Material: Insitu concrete            Finish: Exposed Aggregate            Colour: To match PV02A            Dimension: 300mm (w) x 200mm (d), length varies            Nom. 2 x N16 rods vertically central, 50mm cover - subject to engineer's detail            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Expansion Joints: Ableflex expansion foam fill with mastic topping bead to vertical sides and top at 6m centres, colour to match adjacent pavement.            Control Joints: Saw-cut at 2m centres.            Vapour barrier: 0.2mm polyethylene            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer - Concrete: Boral</p>	TBC	<p>Placeholder Only - Item not currently used. Potential substitute for concrete edge in certain locations, TBC.</p> <p>1. Jointing type, set-out, detail / specification to future structural engineer's detail.</p>	A
ED04	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	Standard Softscape Maintenance Edge (Surface visible, between pavement and softscape)	<p>Material: Insitu concrete            Finish: Smooth, steel trowel            Colour: Standard grey            Dimension: 300mm (w) x 200mm (d), length varies            Nom. 2 x N16 rods vertically central, 50mm cover - subject to engineer's detail            Sealant: DRYTREAT Stain-Proof (Premium Impregnating Sealer) x 2 coats            Expansion Joints: Ableflex expansion foam fill with mastic topping bead to vertical sides and top at 6m centres, colour to match adjacent pavement.            Control Joints: Saw-cut at 2m centres.            Vapour barrier: 0.2mm polyethylene            Sub-base: 125mm FCR to engineer's detail            Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm            Manufacturer - Concrete: Boral</p>	TBC	<p>Placeholder Only - Item not currently used. Potential substitute for concrete edge in certain locations, TBC.</p> <p>1. Jointing type, set-out, detail / specification to future structural engineer's detail.</p>	A
ED04A	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	Standard Softscape Maintenance Edge (Sub-surface, concealed. Between pavement and softscape)	<p>Description: Same as ED04, but for concealed use under edge of unit pavements. Provide nom.30mm mortar bed over to accept paving units over. Smooth steel trowel finish not required.</p>	TBC	<p>Placeholder Only - Item not currently used. Potential substitute for concrete edge in certain locations, TBC.</p> <p>1. Jointing type, set-out, detail / specification to future structural engineer's detail.</p>	A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
ED05	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	Brick Garden Edge	Material: Brikmakers brick paving Finish: As supplied Colour: Autumn Blend Jointing colour: Grey Unit Dimension: 220mm x 110mm x 80mm Pattern: Laid in soldier course perpendicular to adjacent edge. Bedding: Nom. 30mm mortar Sub-base: 125mm FCR to engineer's detail Sub-grade compaction: To engineer's detail, nom. 8 Blows PSP to 300mm Manufacturer: Brikmakers	TBC	Placeholder Only - Item not currently used. Potential substitute for concrete edge in certain locations, TBC.  1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
ED06	Garden Edges (excludes civil kerbs, refer civil engineer's documentation)	Steel Garden Edge	Material: Steel Finish: Corten Colour: Corten Dimension: 5mm (w) x 150mm (d), length varies Installation: Nom. welded N10 threaded backing rod, drilled and chem-set into subsurface reinforced 200mm x 200mm concrete footing, min. 100mm embedment. Rod centres nom. 1m. Footing and connection details subject to engineer's documentation. Top of rod min. 50mm below top of edge. Paint rod and welds for moisture protection. Levels to be confirmed prior to final installation. Sharp edges and corners to be rounded prior to installation. Manufacturer: Custom fabricated, acceptable suppliers TBC	TBC	Placeholder Only - Item not currently used. Potential substitute for concrete edge in certain locations, TBC.  1. Jointing type, set-out, detail / specification to future structural engineer's detail.	A
<b>FURNITURE AND FIXINGS</b>						
FN01	Station Welcome Place, Village Common	SS Bike Hoop	Product: Semi-Hoop Finish: As supplied (brushed) Material: 316 SS Colour: As supplied Mounting: Sub-surface Supplier: Street Furniture Australia Notes: 1. Provide isolation joints to interface with adjacent hardscape material. 2. Installation, footings etc, to suppliers proprietary specification.			A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
FN02	Station Welcome Place, Village Common, Secondary Spaces	Recycle and Refuse Bin	<p>Product: Dual Bin Enclosure            Finish: As supplied            Material: Frame and top - 316 SS / Panels: Aluminium wood grain: 'Spotted Gum'            Colour: Frame and top - As supplied / Panels: 'Spotted Gum'            Mounting: Concealed surface mounting            Supplier: Street Furniture Australia</p> <p>Notes:            1. Provide standards 240L sulo bins with colour coded lids.            2. Provide integrated General Rubbish and Mixed Recycling motifs to enclosure panels.            3. Installation, footings etc, to suppliers proprietary specification.</p>	 <p>Image is a sample only. Final selection to be arched roof with brushed SS frame.</p>		A
FN03	Station Welcome Place, Village Common	Drink Fountain	<p>Product: Arqua Station with Dog Bubbler            Finish: As supplied            Material: 316 SS            Colour: As supplied            Mounting: Sub-surface            Supplier: Street Furniture Australia</p> <p>Notes:            1. Allow for potable cold water service connection.            2. Installation, footings etc, to suppliers proprietary specification.</p>			A
FN04	Station Welcome Place, Village Common	Bench Seat	<p>Product: Aria 3-person bench seat with back and arm-rests            Finish: As supplied            Material: Frame - Cast Aluminium / Battens - Aluminium            Colour: Frame - TBC / Battens - 'Spotted Gum'            Mounting: Pedestal leg, subsurface mounting            Supplier: Street Furniture Australia</p> <p>Notes:            1. Installation, footings etc, to suppliers proprietary specification.</p>	Image TBC		A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
FN05	Station Welcome Place	General Purpose Power Outlet	<p>Description: Double socket GPO power board, IP rated for external conditions.  Housing: Custom fabricated recessed 320 grade SS box housed in external brick seating wall. Housing to fit within equivalent of two brick course heights, located min. 150mm above adjacent ground level from bottom edge of housing.  Coverplate: Must cover full housing frame and sit flush with adjacent wall surface. Tamper proof steel coverplate, locked to PTA standard key. Coverplate to consist of min. 3mm, 316 grade, brushed SS. Sharp corners to be rounded slightly to dull cutting potential. Concealed piano hinge to full length of recess aperture.  Supplier: TBC  Notes:  1. GPO, power supply and connections to Electrical Engineers Documentation.  2. Metering requirements TBC.</p>	Image TBC		A
FN06	Station Welcome Place	External General Purpose Water Service	<p>Description: Nom. Potable, 18mm CWS with inverted hose cock, housed in sub-surface pit with tamper-proof, lockable lid keyed to PTA standard.  Pit and lid: To hydraulic engineer's specification/detail, TBC  Supplier: TBC  Notes:  1. Refer to hydraulic engineers documentation for water service design and specification.  2. Pit's to be located as shown on the landscape drawings, typically in garden bed areas, adjacent to paving.  3. Pit lids to be kept clear of encroaching vegetation.  4. Pits to be sized to suit easy connection of hose.</p>	Image TBC		A
FN07	Station Welcome Place, Village Common	USB Charging Station	<p>Product: LeGrand Outdoor Power Charging Station with Area Light  Finish: As supplied  Material: As supplied  Colour: Black  Mounting: Sub-surface  Footing: To supplier's requirements  Supplier: Landscape Forms  Notes:  1. Power supply and connections to Electrical Engineers Documentation.  2. Metering requirements TBC.</p>			A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
FX01	Station Welcome Place, Secondary Spaces, for Tree Planting Within Paving	Non-Slip Tree Grate	<p>Product: Invisigrate Treegrate            Class: C            Dimension (Surface): 1500 x 1500mm            Finish: Brushed            Material: Frame assembly - 304 SS (as supplied) / Infill material - to match adjacent pavement            Colour: As supplied            Mounting: Sub-surface            Footing: To supplier's requirements            Accessories: Supply growth cushion, infill panel with removable growth rings and double-inlet 'Snorkil' fitting with sub-surface perforated watering pipe.            Supplier: City Green            Notes:            1. Provide isolation joints to interface with adjacent hardscape material.            2. Installation, footings etc, to suppliers proprietary specification.            3. Infill material thickness to be verified with suppliers prior to ordering to ascertain correct infill specification.</p>			A
FX02	Station Welcome Place	SS Bollard - Fixed	<p>Product: Slim Bollard - Flat Top            Finish: As supplied (brushed)            Material: Body and footplate - 316 SS / Head: Polished Aluminium            Colour: As supplied            Mounting: Sub-surface            Footing: To supplier's requirements            Supplier: Street Furniture Australia            Notes:            1. Provide isolation joints to interface with adjacent hardscape material.            2. Installation, footings etc, to suppliers proprietary specification.</p>			A
FX02A	Station Welcome Place	SS Bollard - Removable	<p>Product: Slim Bollard - Flat Top            Finish: As supplied (brushed)            Material: Body and footplate - 316 SS / Head: Polished Aluminium            Colour: As supplied            Mounting: Removable in-ground            Footing: To supplier's requirements            Supplier: Street Furniture Australia            Notes:            1. Provide isolation joints to interface with adjacent hardscape material.            2. Installation, footings etc, to suppliers proprietary specification.</p>			A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
SC01	Sub-surface zones where trees within pavement	Structural Soil Cells	<p>Product: Stratavault Soil Vault System            Finish: As supplied            Material: As supplied            Colour: As supplied            Supplier: City Green            Installation:            Excavate pit to required depth, preparing level subbase to engineer's requirements. Install 100mm deep aggregate drainage layer (nom. 25mm bluemetal). Install nom. two of three layers of Stratvault. Backfill with conditioned soil in bottom two layers per supplier's requirements. Reticulate 2 No. concentric rings of geotextile wrapped perforated corrugated flexible pipe (nom. 50mm diameter) to connect tree grate inlets (refer Item FX01). Install separate sub-surface flexible irrigation reticulation connected to precinct main irrigation system. Install top layer of Statvault, topped with geotextile per supplier's requirements. Apply nom. 125mm thick layer of compacted FCR (subject to engineer's confirmation), screeded to required pavement falls to accept pavement over. Install tree and backfill pre-prepared tree pit (including sub-surface anchors where specified). Install pavements and tree grates as specified.</p>			A
CA01	Welcome Place	Arbour Structure	<p><u>Main Structure</u>            Columns and Outriggers: Nom: 300mm UB fully welded with welded cleats to accept purlins, to engineer's detail.            Purlins: Fabricated inverted 'T' profile, fully welded, nom. 10mm plate x 125mm (h) x 125mm (d), length 2950mm (typ.). Provide fully-welded tabs to accept trellis wire connections on rearward purlins. Pre-drilled holes to accept decorative panel fixings, nom.300mm centres. Subject to engineer's detail.            Paint: Dulux Weathermax HBR MIO system (4 No. coats incl. primer, base-coat, top coat and clear finish coat)            Colour: Charcoal            Fixings: To engineer's spec, painted to match main structure.            Supplier: To contractor's approved nomination</p> <p><u>Decorative Panel</u>            Material: 'Pic-Perf' perforated 3 - 4mm thick solid aluminium panel with rolled / folded edge profile.            Finish: Interpon D2525 ultra-durable powder coating.            Perforations to be &lt;10mm diameter for safety.            Fixings: SS, apply discrete/concealed polyvinyl gromits to mitigate galvanic corrosion. Dimension/gauge to engineer's detail.            Supplier: Locker Group</p> <p><u>Trellis Cabling</u>            Material: Proprietary SS architectural cabling system to supplier's recommendation, inclusive of all fixings and accessories for tensioning and connection to footings and frame. Nom. 15mm dia.            Supplier: Ronstan</p>			A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
			<p><b>Footings</b> All footings to structural engineer's detail. Intermediate trellis cable connections may require separate footings for ground connections between column spans and have above ground connection points to avoid steel being covered by soil. All above ground concrete footing works to minimum Class 2 finish, and sealed, pending future detail. Manufacturer: Dulux</p>			
<p>Top: Indicative architectural rendering of structure. Bottom: Example perforated panel - sample only. Not to be used - for illustrative purposes only.</p>						
MULCH AND SOFTSCAPE						
GB01	Welcome Place	High Quality Garden Bed	<p><b>High Quality Garden Bed</b> <b>Investment Level:</b> 2 <b>Minimum spacing:</b> 2-4 plant/m2 (dependent on mature size) <b>Minimum pot size:</b> 200mm <b>Topsoil:</b> Provide a 100 millimetre depth of soil conditioner, cultivated into existing subsoil or imported topsoil prior to planting and mulching. <b>Mulch:</b> 100mm min depth. Screened Pine Bark Mulch 35-75mm with low combustibility <b>Fertiliser:</b> TBC. Nom. 9-month slow release fertiliser suitable for native plants to landscape architect's approval. <b>Soil Conditioner:</b> Eclipse Aquamor Soil Improver or approved similar. <b>Soil Additive:</b> Growise Bactivate Granules Microbial Soil Conditioner, installed per supplier's requirements. <b>Irrigation:</b> Permanent irrigation. <b>Note:</b> Ensure that all planting areas are not constructed from compacted fill material, and that all planting areas are de-compacted, during preparation works. <i>Refer to Planting Species Schedule</i> <i>Refer to Irrigation Consultants documentation</i></p>	NA		A
GB02	Welcome Place / Car Parks / Streets	Standard Garden Bed	<p><b>Standard Quality Garden Bed</b> <b>Investment Level:</b> 3 <b>Minimum spacing:</b> 4 plants/m2 (dependent on mature size) <b>Minimum pot size:</b> 140mm <b>Topsoil:</b> Topsoil: 50mm depth of weed-free topsoil, mixed with 50mm depth of native chipped vegetation, which is spread in a 100 millimetre depth layer by a tracked machine running perpendicular to the contours to provide depressions for seed germination. <b>Mulch:</b> 100mm min depth. Screened Pine Bark Mulch 35-75mm with low combustibility <b>Fertiliser:</b> TBC. Nom. 9-month slow release fertiliser suitable for native plants to landscape architect's approval. <b>Soil Conditioner:</b> Eclipse Aquamor Soil Improver or approved similar. <b>Soil Additive:</b> Growise Bactivate Granules Microbial Soil Conditioner, installed per supplier's requirements. <b>Irrigation:</b> Temporary establishment irrigation for two years only. <b>Note:</b> Ensure that all planting areas are not constructed from compacted fill material, and that all planting areas are de-compacted, during preparation works. <i>Refer to Planting Species Schedule</i></p>	NA		A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
GB03	Car Parks / Precinct	Basic Garden Bed	<p><b>Basic Quality Garden Bed</b>  <b>Investment Level: 4</b>  <b>Minimum spacing:</b> 3 plants/m2 (dependent on mature size)  <b>Minimum pot size:</b> 140mm  <b>Topsoil:</b> Topsoil: 50mm depth of weed-free topsoil, mixed with 50mm depth of native chipped vegetation, which is spread in a 100 millimetre depth layer by a tracked machine running perpendicular to the contours to provide depressions for seed germination.  <b>Mulch:</b> 100mm min depth. Screened Pine Bark Mulch 35-75mm with low combustibility.  <b>Fertiliser:</b> TBC. Nom. 9-month slow release fertiliser suitable for native plants to landscape architect's approval.  <b>Soil Conditioner:</b> Eclipse Aquamor Soil Improver or approved similar.  <b>Soil Additive:</b> Growise Bactivate Granules Microbial Soil Conditioner, installed per supplier's requirements.  <b>Irrigation:</b> Temporary establishment irrigation for two years only.  <b>Note:</b> Ensure that all planting areas are not constructed from compacted fill material, and that all planting areas are de-compacted, during preparation works.  <i>Refer to Planting Species Schedule</i></p>	NA		A
GB04A / GB04B / GB04C	Precinct Swales and Basins	Non-Irrigated Swales and Basins	<p><b>Swales and Basin Garden Bed</b>  <b>Investment Level: 4</b>  <b>Minimum spacing:</b> Planted at 4-8 plants/sqm (8/m2 at base of swale).  <b>Minimum pot size:</b>  GB04A - 200mm  GB04B - 140mm  GB04C - Tube stock (50% forestry tubes and 50% 50mm tubes)  <b>Mulch:</b> 100mm depth. 10-15mm screened stone mulch.  <b>Fertiliser:</b> TBC. Nom. 9-month slow release fertiliser suitable for native plants to landscape architect's approval.  <b>Soil Conditioner:</b> Eclipse Aquamor Soil Improver or approved similar.  <b>Soil Additive:</b> Growise Bactivate Granules Microbial Soil Conditioner, installed per supplier's requirements.  <b>Filter medium:</b> Install nom. 600mm deep Phosphorus retention filter media to base and sides of swale. (Acceptable product: Eclipse Soils Phosphorus Retentive Filter Media).  <b>Irrigation:</b>  GB04A - Permanent irrigation.  GB04B / GB04C - Temporary establishment irrigation for two years only.  <b>Note:</b> Ensure that all planting areas are not constructed from compacted fill material, and that all planting areas are de-compacted, during preparation works.  <i>Refer to Planting Species Schedule</i></p>	NA		A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
GB06	Precinct	Non-Irrigated Tubestock Revegetation	<b>Tubestock Revegetation Garden Bed</b> <b>Location:</b> <b>Minimum spacing:</b> 2 per m2 <b>Minimum pot size:</b> tube stock <b>Topsoil:</b> 50mm depth of weed-free topsoil, mixed with 50mm depth of native chipped vegetation, which is spread in a 100 millimetre depth layer by a tracked machine running perpendicular to the contours to provide depressions for seed germination. <b>Mulch:</b> 100mm min depth. Screened Pine Bark Mulch 35-75mm with low combustibility <b>Fertiliser:</b> TBC. Nom. 9-month slow release fertiliser suitable for native plants to landscape architect's approval. <b>Soil Conditioner:</b> Eclipse Aquamor Soil Improver or approved similar. <b>Soil Additive:</b> Growise Bactivate Granules Microbial Soil Conditioner, installed per supplier's requirements. <b>Irrigation:</b> Non-Irrigated, initial planting and top-up planting during winter only. <b>Note:</b> Ensure that all planting areas are not constructed from compacted fill material, and that all planting areas are de-compacted, during preparation works. <i>Refer to Planting Species Schedule</i>	NA		A
GB08	Precinct	Mulch Only	<b>Mulch:</b> 100mm min depth. Screened Pine Bark Mulch 35-75mm with low combustibility	TBC		A
GB10	Precinct High Quality Areas in Shade	Shade Tolerant High Quality Garden Bed	Same as GB01 but with shade tolerant species mix.	NA		A
LS01	Station forecourt / Welcome Place	Irrigated Lawn	Species: Kikuyu ( <i>Pennisetum clandestinum</i> ) Topsoil: Imported 150mm free draining turf sand - Eclipse Aquamor Soil Improver Subgrade: Ensure free draining to 300mm depth Fertiliser: Suitable slow release turf lawn fertiliser to landscape architect's approval.	NA		A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
LS02	NA	Non-Irrigated Lawn	<p>Species: Kikuyu (<i>Pennisetum clandestinum</i>)</p> <p>Topsoil: Imported 150mm free draining turf sand - Eclipse Aquamor Soil Improver</p> <p>Subgrade: Ensure free draining to 300mm depth</p> <p>Fertiliser: Suitable slow release turf lawn fertiliser to landscape architect's approval.</p>	NA	Placeholder item only - not currently used.	A
TR01	Welcome Place	1500L Tree	<p>Guy Rope Support: Shall be guyed utilising Arborguys, with stainless steel wires and fixings installed over the root ball fixed with a minimum of 3 below ground anchors.</p> <p>Soil Conditioner: 30% of the trees container size, mixed well into the existing soil.</p> <p>Acceptable product: Eclipse Aquamor Soil Improver.</p> <p><i>Refer to Planting Species Schedule</i></p>			A
TR02	Welcome Place	500L Tree	<p>Guy Rope Support: Shall be guyed utilising Arborguys, with stainless steel wires and fixings installed over the root ball fixed with a minimum of 3 below ground anchors.</p> <p>Soil Conditioner: 30% of the trees container size, mixed well into the existing soil.</p> <p>Acceptable product: Eclipse Aquamor Soil Improver.</p> <p><i>Refer to Planting Species Schedule</i></p>			A
TR03	Welcome Place	200L Tree	<p>Stakes: 2No 1800 high 50x50 hardwood stakes, securely placed and tied with flexible rubber or cloth tree ties. Hardwood stakes shall be painted black.</p> <p>Stake Paint: 2No coats of Dulux exterior paint- matt black.</p> <p>Soil Conditioner: 30% of the trees container size, mixed well into the existing soil.</p> <p>Acceptable product: Eclipse Aquamor Soil Improver.</p> <p><i>Refer to Planting Species Schedule</i></p>			A

CODE	INDICATIVE LOCATION	TYPE	DESCRIPTION	IMAGE	NOTES	REV
TR04 / TRO4A	Welcome Place / Car Parks	100L Tree	Stakes: 2No 1800 high 50x50 hardwood stakes, securely placed and tied with flexible rubber or cloth tree ties. Hardwood stakes shall be painted black. Stake Paint: 2No coats of Dulux exterior paint- matt black. Soil Conditioner: 30% of the trees container size, mixed well into the existing soil. Acceptable product: Eclipse Aquamor Soil Improver. <i>Refer to Planting Species Schedule</i>			A
TR05	Car Parks / Revege Areas	45L Tree	Stakes: 2No 1800 high 50x50 hardwood stakes, securely placed and tied with flexible rubber or cloth tree ties. Hardwood stakes shall be painted black. Stake Paint: 2No coats of Dulux exterior paint- matt black. Soil Conditioner: 30% of the trees container size, mixed well into the existing soil. Acceptable product: Eclipse Aquamor Soil Improver. <i>Refer to Planting Species Schedule</i>			A

## Appendix D - Acoustic Report



## **METRONET Stage 1: Morley-Ellenbrook Line**

### **Ellenbrook Station Acoustic Design Report**

**MEL-MLCX-AR-RPT-00035**

Rev	Date	Purpose of Issue	Prepared	Reviewed	Approved
A	08/07/2021	Issued for Information	L Zoontjens	A White	A White

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Project	METRONET Stage1: Morley-Ellenbrook Line
Client	Public Transport Authority
PTA Contract Number	PTA200001
Laing O'Rourke Project No.	K97

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## 1. Executive Summary

This document discusses noise and vibration levels expected with operation of the proposed Ellenbrook Train Station and the extent to which those levels comply with applicable statutory and project requirements.

On the basis of the assessment undertaken it is concluded that:

- Overall environmental rail noise levels, when assessed at nearby potential noise sensitive premises are expected to comply with applicable state noise regulations and planning policy. Rail vibration levels are expected to be compliant with recommended levels.
- Noise from car parking areas, local vehicle traffic and bus movements will increase significantly in the area from current conditions, but are expected to remain compliant with relevant state policies.
- Car parking areas should avoid the use of speed humps, loose laid road coverings or smooth concrete surfaces to minimise noise emissions.
- Design of the station plant and facilities such as mechanical services, public address and crowding areas to meet applicable environmental noise regulations may be achieved through conventional / industry standard design approaches and therefore is not anticipated to require specialist design input.

**Acknowledgement of Country**

MELconnx acknowledges the Whadjuk People of the Noongar Nation as the Traditional Custodians of the land and waters on which the Morley-Ellenbrook Line Project is located. We pay our respect to their Elders, both past and present and thank them for their continuing connection to the country, culture and community.

## 2. Project overview

### 2.1 METRONET Vision and Objectives

As Perth’s single largest investment in public transport, METRONET will transform the way people commute and connect. It will create jobs and business opportunities and stimulate local communities and economic development to assist communities to thrive. The METRONET vision is for a well-connected Perth with more transport, housing and employment choices.



In delivering METRONET, the WA Government has considered peoples’ requirements for work, living and recreation within future urban centres with a train station at the heart.

The objectives are to:

- Support economic growth with better connected businesses and greater access to jobs
- Deliver infrastructure that promotes easy and accessible travel and lifestyle options
- Create communities that have a sense of belonging and support Perth’s growth and prosperity
- Plan for Perth’s future growth by making the best use of our resources and funding
- Lead a cultural shift in the way government, private sector and industry work together to achieve integrated land use and transport solutions for the future of Perth.

### 2.2 Morley-Ellenbrook Line overview

As Perth grows, so does the need for rail infrastructure and METRONET is a critical element of the State Government’s infrastructure agenda. The Morley-Ellenbrook Line (MEL) Project will improve connectivity between the north east metropolitan area and the rest of the city and unlock economic development in these local community areas.



Figure 1: Morley-Ellenbrook Line © METRONET

The Public Transport Authority (PTA) is the lead agency delivering the MEL Project, with Main Roads WA (MRWA) undertaking some enabling works.

### 2.2.1 Project features

Transport infrastructure works for the Project include:

- A 21km rail line spurring from the Midland Line east of Bayswater Station, travelling north in the Tonkin Highway median, east through land north of Marshall Road and north on the western side of New Lord Street into Ellenbrook
- Stations at Morley, Noranda, Malaga, Whiteman Park and Ellenbrook with future-proofing for a station at Bennett Springs East
- Parking and bus interchanges/facilities at stations
- Significant grade separations at key road crossings
- Underpasses to allow the rail line to enter and exit the Tonkin Highway median
- Principal shared paths for walking and cycling access along the rail line
- Track and associated infrastructure to connect to the existing Midland Line
- Road and bridge reconfiguration works
- Integration across the packages of works and other nearby projects.

### 2.2.2 General scope of works

The Project's general scope of works includes the design and delivery of rail infrastructure and ancillary works to support operational passenger rail between Bayswater and Ellenbrook, including stations with inter-modal bus and rail with parking and associated road works at Bayswater, Morley, Noranda, Malaga, Whiteman Park and Ellenbrook stations.

The Project activities include all investigation, design, approvals, construction, testing and commissioning, Entry Into Service (EIS), training and operational readiness required to incorporate the new railway to Ellenbrook, and tie into the existing network including the associated road, utilities and other required works to interface with adjacent works and contracts. This will include bulk earthworks and retaining, structures, grade separations, roads and drainage.

The design and delivery of the main works package for the Project is broken into three distinct stages:

- Alliance Development Stage
- Project Alliance Reference Design Stage
- Project Alliance Delivery Stage (Detailed Design through to Project close-out).



Figure 2: Architect's Impression of Ellenbrook Station © MELconnx

### 2.2.3 Key Project Objectives, Key Compliance Objectives and Critical Success Factors

The PTA and MELconnx’s single Non-Owner Participant (NOP) Laing O’Rourke Construction Australia Pty Ltd, have formed an integrated, collaborative Project Alliance to successfully deliver rail infrastructure that reflects our absolute commitment to achieving the Project Objectives and delivering positive outcomes for the State.

The following image demonstrates how we have mapped each Key Project Objective in the Project Alliance Agreement (PAA) against the Critical Success Factors to achieve best-for-project outcomes, underpinned by the Key Compliance Objectives.

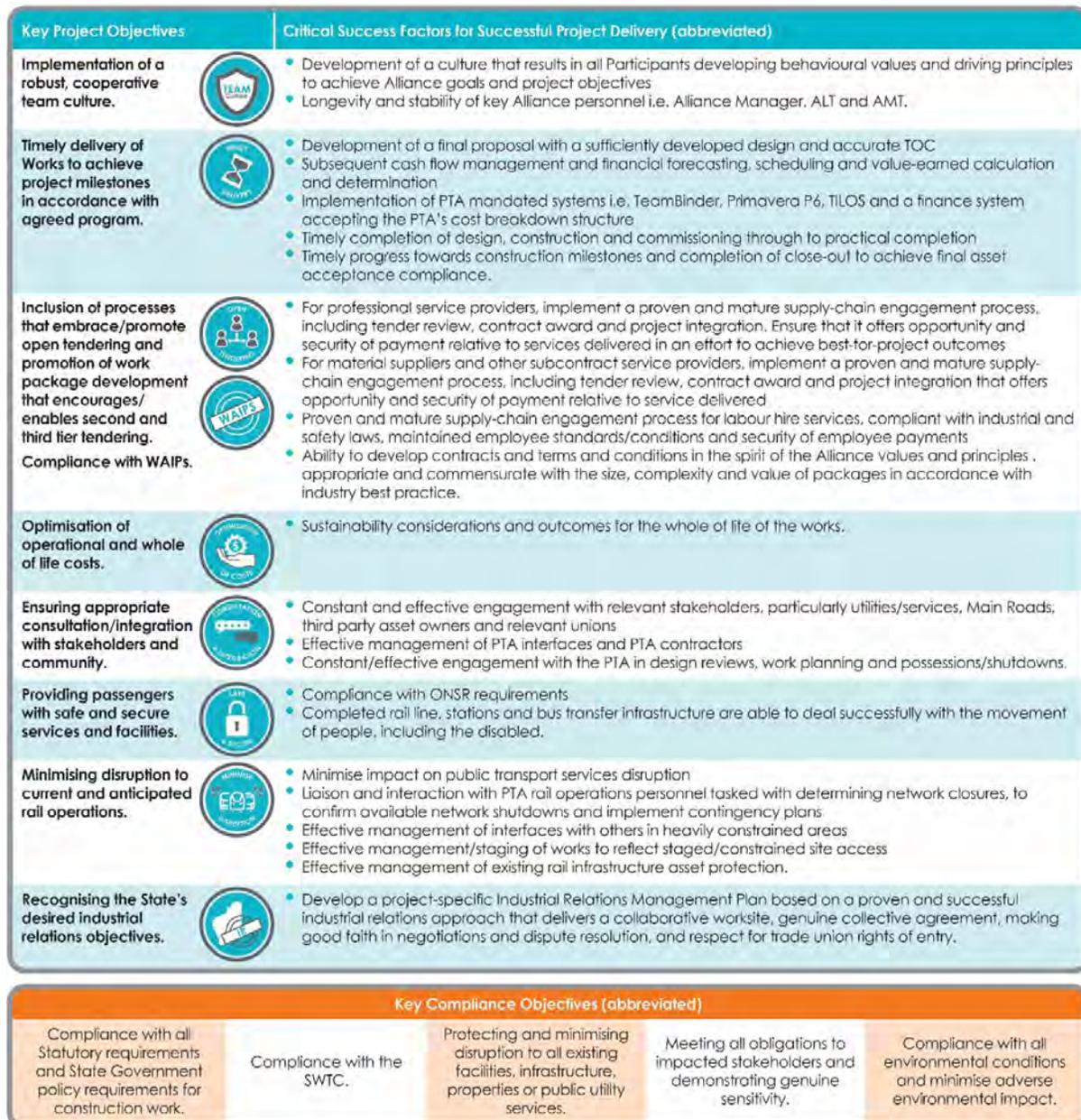


Figure 3: Key Project Objectives, Critical Success Factors and Key Compliance Objectives



## 2.4 Purpose of the Report

Ellenbrook Station is proposed as a terminus where all trains will slow down and stop at the station (no non-stop 'through' traffic).

The project will also involve the construction of car parks, bus and car drop off points and pedestrian facilities, the operation of which may involve a change in noise levels at nearby residential and other sensitive locations.

This document discusses noise and vibration levels expected with operation of the proposed Ellenbrook Train Station and the extent to which those levels comply with applicable statutory and project requirements.

This Design Report identifies any interdependencies between each Design Package and how those dependencies have been accommodated within the document. The Design Report describes the relationship between each of the Package(s) engineering lifecycle and the assurance gates throughout the Project.

## 2.5 Changes Since Previous Design Submission

### 2.5.1 Alliance Development Stage to Reference Design Stage

Not applicable at this Design Stage.

### 2.5.2 Reference Design to Interim Detailed Design

Not applicable at this Design Stage.

### 2.5.3 Interim Detailed Design to Final Detailed Design

Not applicable at this Design Stage.

### 2.5.4 IFC Design Finalisation

Not applicable at this Design Stage.

## 3. Design Description

### 3.1 Scope of this Design Package

The scope of this Design Package is outlined as follows.

- A schedule of recommended controls where required to be considered and reviewed for design optimisation and design/statutory planning approval within the packages is described in Section 3.3.
- No development of software and application data for systems.
- No specific computer hardware resources including processor type, operating systems, development environment, capacity, interfaces and timing diagrams

### 3.2 Design Description

The following subsections discuss the key project noise and vibration issues assessed in further detail.

#### 3.2.1 Rail operations

Treatments to the railway sections involved at Ellenbrook Station are considered not required. Speeds in the immediate vicinity of the station are too low for rolling noise levels to be above State Planning Policy 5.4 (SPP5.4) targets that may be assessable at nearby mixed-use development.

Note that compliance with SPP5.4 does not prevent community complaint. Subjectively, residents in the area will notice noise from low speed rail movements and the braking system air release as trains depart. Train air conditioning systems may also be noticeable on unusually hot days. These noise emissions are modelled to be within SPP5.4 targets.

Given the expected speeds in the immediate vicinity of the station, vibration levels are expected to be within recommended criteria applicable at anticipated future development sites nearby.

### 3.2.2 Station and associated infrastructure

Standard steel boundary fencing is anticipated where car parking areas adjoin nearby premises.

Asphaltic or bitumen based road and vehicle parking surfaces should be used instead of smooth concrete or heavily painted surfaces which can result in strong sound reflections and tyre squeal under cornering.

Speed bumps or sudden changes in road level (e.g. loose gutters, expansion control joints) should be avoided.

From Section 5.2 it can be seen that noise impacts at adjacent future development areas from road vehicles can be managed to levels compliant with applicable criteria.

On the basis of a screening assessment of proposed public address systems (Section 4.8.1) and likely crowd noise (Section 4.8.2), compliance with relevant assigned noise levels are expected.

### 3.2.3 Electrical transformer noise

The transformer located at the boundary of the Civic Terrace car park is more than 75 metres from the nearest noise sensitive (commercial) premises. Based on expected loading and sound power levels for transformers, it is expected that noise emissions will be compliant with applicable noise regulations.

### 3.2.4 Mechanical noise

A basic screening assessment has been undertaken considering the minimum distance to potential future noise sensitive development and the proposed mechanical plant and equipment. Given the equipment comprises small enclosed fan coil units and domestic level air conditioning outdoor condensers, compliance with applicable noise regulations is expected.

### 3.2.5 Local road traffic and new roundabouts

Local road vehicle traffic noise may vary due to the introduction of the proposed train station, but is not assessable within the criteria outlined.

## 3.3 **Relationship with other Design Packages**

The relationship and/or reliance of this design package on other MEL design packages is derived from the N2 Matrix and is outlined in the Table below.

Relationship with other Design Packages	Description/Title	Interface Elements	Integration Strategy
<b>E018</b>	Line wide - Permanent Way and Stabling & Track – Transit Space & Structure /Ballast Interface	Trackform Rail web dampers Under ballast matting	Confirm trackform Review rail web damper options
<b>E016</b>	LW Urban Design - Urban Design - Architecture	Noise walls	Confirm spatial inputs and coordinate implementation of recommended treatments
<b>E017</b>	Linewide Urban Design - Landscape	Noise walls	Confirm spatial inputs and coordinate implementation of recommended treatments
<b>E013</b>	Ellenbrook Precinct – Urban Design – Architecture	Noise walls	Confirm spatial inputs and coordinate implementation of recommended treatments

<b>E110</b>	Ellenbrook Precinct Civil - Fencing and Gates, Retaining Walls & Minor Structures, Noise Walls	Noise walls	Confirm spatial inputs and coordinate implementation of recommended treatments
<b>E113</b>	Ellenbrook Station – Electrical - Lighting & LV & Comms & Security	Electrical plant noise emissions	Confirm inputs and coordinate implementation of any recommended treatments
<b>E116</b>	Ellenbrook Station – Mechanical and BMCA	Mechanical plant noise emissions	Confirm inputs and coordinate implementation of any recommended treatments

### 3.4 External Interfaces

The relationship and/or reliance of this design package on external interfaces and details of integration strategies are outlined in the Table below.

Item	External Party	Interface Elements	Integration Strategy
	N/A		

## 4. Design Inputs

### 4.1 Project Design Requirements

The following design inputs, loads combinations, standards and other key design inputs have been used in preparation of this report;

#### 4.1.1 Environmental noise regulations

Refer to Section 4.5.1 below.

#### 4.1.2 SWTC Requirements

Refer to Section 4.5.3 below.

#### 4.1.3 Operational Scenarios

Normal operations are expected to result in 74 train movements per day (6am to 10pm) and 16 movements per night (10pm to 6am) at the Ellenbrook Station.

The “PTA Concept Train Operating Plan” described as being within Book 5 of the SWTC could not be accessed. In lieu of this information, these volumes are used from the Reference Design.

#### 4.1.4 Stations and Infrastructure

Stations and infrastructure have been assessed on the basis of supplied drawings to date and 16 buses per hour typical day scenario.

We note that the design of each station utilises natural ventilation strategies, with significant openings at roof level throughout the station.

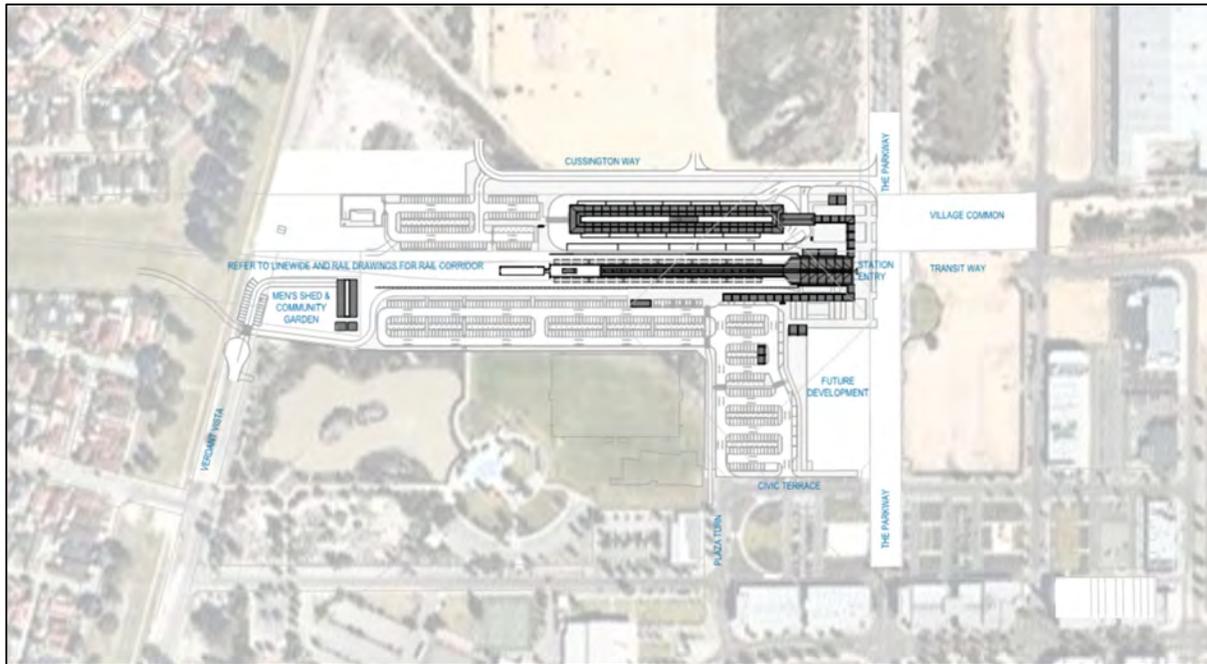


Figure 6: Extract of architectural site plan 25-A-291-AR0012\_A indicating site locality.

#### 4.1.5 Electrical transformers

From the supplied drawings, it can be seen that the transformers associated with the station are the order of 75 metres or more from the nearest potential noise sensitive premises or future land use. By inspection of the likely transformer sound power level / loading and the proposed screening elements, compliance with the relevant assigned noise levels is expected.

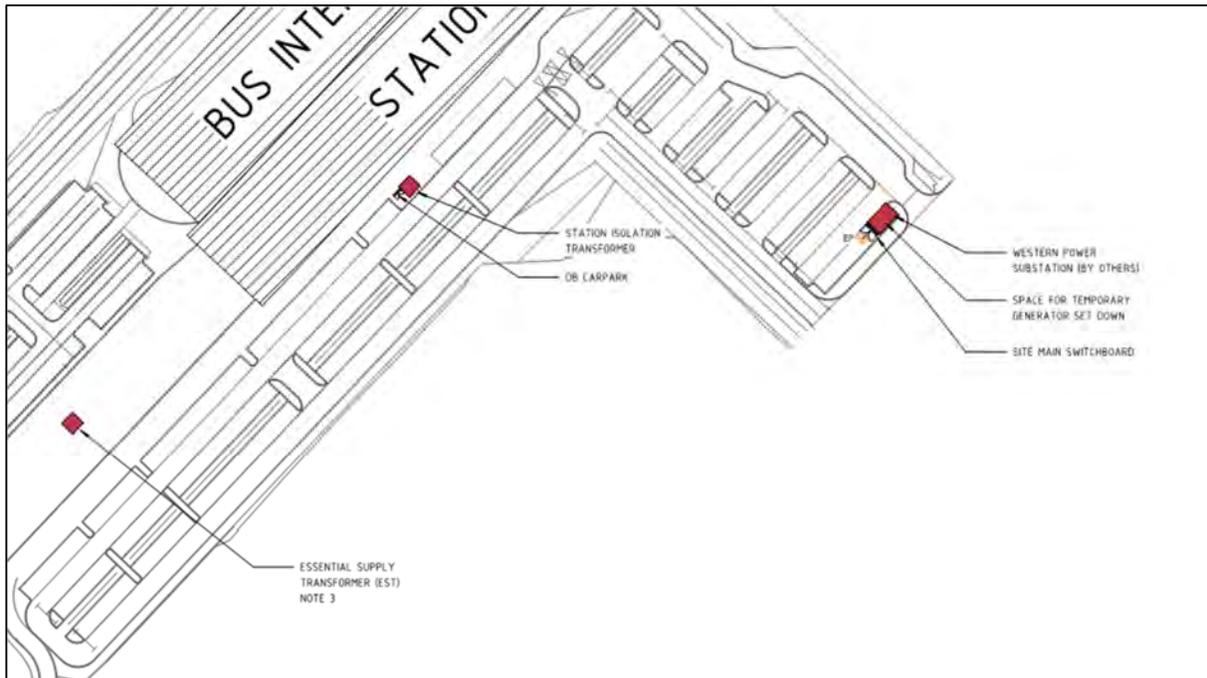


Figure 7: Extract of electrical power plan 25-A-291-EG0110\_A

#### 4.1.6 Mechanical outdoor plant

Drawings 25-A-291-ME0008 to -ME0013 indicate that the outdoor mechanical plant comprise condenser units. Based on rooms served, each would have capacities the order of 6 kW or less (similar to domestic residential air conditioning systems). These units, assessed in cumulative terms, are considered compliant with the assigned noise levels defined in Section 4.5.1 at the nearest likely noise sensitive premises, allowing for future mixed use development in the area.

## 4.2 Design Software Used for this Package

Computer software used to develop this package is outlined in the Table below.

Reference	Supplier	Usage
MS Office 2013	Microsoft Inc. (with proprietary SLR code)	Calculation of in-car noise levels Calculation of 3D receiver distances Calculation of 1D vibration propagation Consolidation and presentation of results 1D propagation / noise analyses
SoundPLAN v8.1	SoundPLAN GmbH	Calculation of site wide airborne noise emissions according to prescribed standards

## 4.3 Applicable Codes and Standards

Applicable standards, codes and guidelines to this design package (at time of project commencement) including identification of specific provisions, criteria and classifications are provided in the Table below.

Reference	Description/Title	Compliance (Specific Provisions, Criteria and Classifications)
<b>Australian and Other Standards and Guidelines</b>		
<b>CR NOI TSI</b>	Technical specification for interoperability relating to the subsystem 'rolling stock – noise' of the trans-European conventional rail system, adopted by the Commission Decision 2011/229/EU, April 2011	
<b>SPP5.4</b>	State Planning Policy No. 5.4 Road and Rail Noise 2019	
<b>EPNR</b>	Western Australia Environmental Protection (Noise) Regulations 1997	
<b>AS 2670.1</b>	Evaluation of human exposure to whole-body vibration - General requirements	
<b>AS 2670.2</b>	Evaluation of human exposure to whole-body vibration - Continuous and shock-induced vibration in buildings (1 to 80 Hz)	
<b>ISO GUIDE 98-3</b>	Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)	
<b>ISO 2631-1:1997</b>	Mechanical vibration and shock - Evaluation of human exposure to whole-body vibration - Part 1: General requirements.	

Reference	Description/Title	Compliance (Specific Provisions, Criteria and Classifications)
<b>AS ISO 2631.2:2014</b>	Mechanical vibration and shock - Evaluation of human exposure to whole-body vibration - Vibration in buildings (1 Hz to 80 Hz).	
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc, 2011 ASHRAE Handbook - Heating, Ventilating, and Air-Conditioning APPLICATIONS - SI Edition, Atlanta GA <a href="http://www.ashrae.org">http://www.ashrae.org</a>	
<b>FTA</b>	C.E. Hanson, D.A. Towers, and L.D. Meister 2006, Transit Noise and Vibration Impact Assessment, Office of Planning and Environment, Federal Transit Administration, Report FTA-VA-90-1003-06, Washington DC	
<b>Nord2000</b>	Jonasson HG, Storeheier S. Nord 2000. New Nordic prediction method for rail traffic noise [Internet]. 2001. (SP Rapport).	
<b>Green Star</b>	Green Star Design and As-built Requirements for Railway Stations (v1.1)	
<b>ISCA</b>	Infrastructure Sustainability Council of Australia (ISv2.0) Design and As Built	
<b>PTA Standards and Specifications</b>		

#### 4.4 Reference Information

The project specific reference information and reports that have been used as inputs into the development of the detailed design are included in the table below.

Document Reference	Description/Title	Revision
<b>25-A-291-AR0001 to - AR0166</b>	E013 Ellenbrook Station - Urban Design - Architecture	A, A01
<b>25-A-291-EG0001 to - EG0168</b>	E113 Ellenbrook Station - Electrical - Lighting & LV & Comms & Security	A, A01
<b>25-A-291-ME0001 to - ME0017</b>	E013 Ellenbrook Station – Mechanical and BMSC	A, A01
<b>25-A-291-EC0151</b>	MEL - MLCX - ELLENBROOK STATION - COMMUNICATIONS - EASE ACOUSTIC MODEL - SHEET 01	2
<b>25-A-291-EC0152</b>	MEL - MLCX - ELLENBROOK STATION - COMMUNICATIONS - EASE ACOUSTIC MODEL - SHEET 02	2
<b>GCOR-LOR-LW-00096</b>	Track Inputs for Noise Modelling	02-Jun-2021 13:10 AWST

Document Reference	Description/Title	Revision
GCOR-LOR-PW-00193	Design data for SLR noise modelling	07-May-2021 19:02 AWST
GCOR-LOR-PW-00166	MELconnx CAD issue to SLR	30-Apr-2021 09:42 AWST
GCOR-LOR-LW-00047	Latest WIP rail strings	19-Apr-2021 11:51 AWST
GCOR-LOR-PW-00128	Update to Health Safety Environmental Management System	06-Apr-2021 15:56 AWST
GCOR-LOR-PW-00071	Aerial Imagry (sic)	01-Apr-2021 15:48 AWST
GCOR-LOR-PW-00067	Project AD Design Information On ASite	23-Feb-2021 11:16 AWST
(TBA)	<Architectural and Civil Drawing packages>	
	Baseline Noise and Vibration Measurements (SLR Consulting)	(in preparation)

## 4.5 Design Criteria

The design criteria utilised in the development of this report are outlined below.

### 4.5.1 Environmental Noise Regulations

Environmental noise emissions (excluding trains and some emissions from road vehicles) from various premises to nearby noise receiving premises are covered by legislation in the form of the *Western Australia Environmental Protection (Noise) Regulations 1997*, which operate under the *Environmental Protection Act 1986*. For this project, these regulations apply to stations and ancillary operational equipment, and specifically do not apply to narrow gauge trains.

To achieve compliance, received noise levels at nearby premises including noise sensitive premises (for example, residential, commercial and industrial premises) are not to exceed specified noise limits in the form of assigned noise levels. The Act gives state authorities powers to order financial penalties and closure of plant that are in excess of assigned noise levels through a formal investigation process. There are methods within the Regulations by which assets found to be producing excessive noise be managed on an ongoing basis in consultation with the Department of Water and Environment Regulation (DWER), say through noise management plans and/or alternative criteria, however at its core of any such agreement is that the proponent will exercise all reasonable and practicable measures to minimise noise.

The assigned noise levels, as shown in Table 1, vary for each noise sensitive receiver, as they are determined from consideration of Influencing Factors (IF) which takes into account the amount of commercial, industrial and road transport infrastructure within specific distances to the receiving noise sensitive premises.

Table 1 Table of Assigned Noise Levels, dB

Part of premises receiving noise	Time of day	LA10	LA1	LAmx
Noise Sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use	0700 to 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays	40 + IF	50 + IF	65 + IF

Part of premises receiving noise	Time of day	LA10	LA1	LAm <sub>ax</sub>
	1900 to 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 Monday to Saturday and 0900 hours Sunday and public holidays	35 + IF	45 + IF	55 + IF
<b>Noise Sensitive premises at locations further than 15 metres from a building directly associated with a noise sensitive use.</b>	All hours	60	75	80
<b>Commercial premises</b>	All hours	60	75	80
<b>Industrial and utility premises</b>	All hours	65	80	90

Regulation 7 of the *Environmental Protection (Noise) Regulations 1997* requires that, if noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality, modulation and impulsiveness, then a series of adjustments must be added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level. The adjustments are detailed in Table 2 and are further defined in Regulation 9(1) of the *Environmental Protection (Noise) Regulations 1997*.

Note that the following adjustments (Table 2) generally apply to fixed plant and infrastructure only.

Table 2 Table of adjustments for intrusive characteristics

Application	Where tone(s) are present	Where modulation is present	Where impulsiveness is present
<b>Adjustment where noise emission is not music (These adjustments are cumulative to a maximum of 15 dB)</b>	+5dB	+5dB	+10dB

**Tones** are defined in Regulation 9(1) as being present where the difference between the A weighted sound pressure level in any one third octave band and the arithmetic average of the A-weighted sound pressure levels in the two adjacent one third octave bands is greater than 3dB in terms of  $L_{Aeq,T}$  where the time period T is greater than 10% of the representative assessment period, or greater than 8dB at any time when the sound pressure levels are determined as LAS levels.

**Modulation** is defined as a variation in the emission of noise that —

- is more than 3 dB  $L_{AF}$  or is more than 3 dB  $L_{AF}$  in any one third octave band;
- is present for at least 10% of the representative assessment period; and
- is regular, cyclic and audible.

**Impulsiveness** is defined as present where the difference between  $L_{Apeak}$  and  $L_{ASmax}$  is more than 15dB when determined for a single representative event.

During the assessment process the above adjustments have been applied to relevant noise sources, taking into account specific intrusive characteristics of these noise sources based on SLR's in-house noise database. It is unlikely that modulation or impulsiveness characteristics would apply to PTA fixed assets being typically electrical power transformers or air handling plant

#### 4.5.2 SPP5.4

SWTC 13.6.1-3 states that

*The Alliance must design and construct the operating passenger railway and any associated noise mitigation controls to meet the requirements of "State Planning Policy No. 5.4 Road and Rail Noise (SPP 5.4)" (WAPC, 2019).*

*The Alliance must design and construct the operating passenger railway to ensure that the  $L_{Amax}$  applicable to the 95th percentile train passby event is 80 dB or less at buildings with a noise sensitive use located on noise sensitive premises.*

The table below outlines the adopted noise objective levels in regard to airborne noise during road and rail operations. Noise mitigation must be provided where the noise level is above these targets

Metric	Application	Value(s)	Notes
<b>Period average noise levels</b>	<b>Major upgrade of existing railway</b> <i>Applied where emissions from MID and FAL lines are considered significant (Bayswater area)</i>	$L_{Aeq,day}$ 60 dB	SPP5.4
		$L_{Aeq,night}$ 55 dB	
	<b>New railway</b> <i>(All other locations)</i>	$L_{Aeq,day}$ 55 dB	
		$L_{Aeq,night}$ 50 dB	
<b>Maximum noise levels</b>	<b>Line wide</b>	$L_{Amax}$ 80 dB	95 <sup>th</sup> percentile. SWTC

These objectives are assessed outdoors, 1 metre from the main building on a lot associated with a noise sensitive usage. Consistent with SPP5.4, the criteria are assessed

- Only at premises that are occupied or designed for occupation or use for residential purposes (including dwellings, residential buildings or short-stay accommodation), caravan parks, camping grounds, educational establishments, child care premises, hospital, nursing home, corrective institution; or place of worship (Note that this excludes recreational parks, commercial and industrial premises along the alignment – results will be determined for these locations, but mitigation would not be recommended); and
- at all floor levels where identified from surveys, noting that sufficient mitigation (in the context of the targets) may not be reasonable or practicable at higher floors.

#### 4.5.3 Stations and Associated Infrastructure

Section 13.7 of Book 5 of the SWTC details the noise and vibration Technical Criteria requirements for the design and operation of the station and associated infrastructure, and includes the following statements:

*The Alliance must address noise and vibration impacts associated with station noise impacts, inclusive of any new road infrastructure to service the stations, to surrounding sensitive receivers, occupational health and amenity for PTA staff and patrons.*

*[..] Noise and Vibration Criteria for Impacts to Surrounding Sensitive Premises at Stations and associated infrastructure (eg. car parks, plant rooms etc.) must be designed to comply with the requirements of the Environmental Protection (Noise) Regulations 1997 (WA).*

*[..] The Alliance shall determine the noise criteria for impacts from Station entry roads and grade separations and design roads and any associated noise mitigation controls to meet the requirements of Western Australia State Planning Policy No 5.4, Road and Rail Noise 2019.*

##### 4.5.3.1 Ambient Noise Levels within Passenger Station Areas

Section 13.7.1 of the SWTC defines acceptable noise levels via the following table, as defined in AS 1055.1:1997 and assessed according to AS/NZS 2107:2000. In accordance with the SWTC it is proposed to follow this the 2000 version of AS/NZS 2107 and not the more recent 2016 version.

Area	Scenario	Minimum acceptable noise level (dB)	Maximum acceptable noise level (dB)
<b>Ticket sales area</b>	Building services and plant	-	L <sub>Aeq</sub> 45
<b>General office areas</b>	Building services and plant	-	L <sub>Aeq</sub> 45
<b>Staff crib rooms</b>	Building services and plant	-	L <sub>Aeq</sub> 45
<b>Public waiting areas, kiosks</b>	Building services and plant	-	L <sub>Aeq</sub> 45
<b>Toilets and amenities</b>	Building services and plant	L <sub>Aeq</sub> 45	L <sub>Aeq</sub> 55
<b>Parking and waste storage areas</b>	Building services and plant	-	L <sub>Aeq</sub> 65
<b>Platforms, at any position within 1.5m of platform edge or centreline (whichever is closer to track), and more than 8 metres from Portals</b>	Stationary trains, auxiliary equipment operating as normal	-	L <sub>Aeq</sub> 70
	Moving trains	-	L <sub>ASmax</sub> 80
	Building services and plant (ventilation, escalators, etc.)	-	L <sub>Aeq</sub> 55
	Emergency smoke fan systems	-	L <sub>Aeq</sub> 85
<b>Plantrooms</b>	Building services and plant	-	L <sub>Aeq</sub> 85
<b>All other areas</b>	All	-	Table 1, AS/NZS 2107:2000 'Satisfactory' values plus 5dB

Section 13.7.1 of the SWTC also states that

*For enclosed rooms containing plant, equipment and electrical power Assets, noise levels must be assessed at no less than 1 metre from any item of equipment; and noise levels from mechanical ventilation systems serving the room must not exceed L<sub>Aeq</sub> 65dB.*

*The criteria listed above in this section do not apply to systems or components operating in emergency mode. In this situation, noise generated by the systems or their components must comply with AS 1670.4 and AS 1668.1, and not exceed levels that affect speech intelligibility in egress paths, evacuation assembly areas, or operational or emergency control rooms or areas.*

#### 4.5.3.2 Noise and Vibration Ingress into Passenger Station Areas

Section 13.7.2 of the SWTC states that the Alliance shall comply with the following requirements:

*External noise ingress from all associated road and rail traffic sources controlled according to the requirements of the WAPC State Planning Policy No 5.4 Road and Rail Noise (SPP 5.4) 2019.*

*Floor vibration levels within publicly accessible areas from plant, equipment or external sources not exceed L<sub>v, RMS,1s</sub> 112dB.*

#### 4.5.3.3 Reverberation within Passenger Station Areas

Section 13.7.3 of the SWTC states that the Alliance shall comply with the following requirements:

Within platform areas, the spatial average reverberation time (RT60) values for the full octave bands with centre frequencies 500Hz and 1kHz not exceed 1.3 seconds for the scenario where 100 patrons are present, or 1.6 seconds when empty.

At all other areas, spatial average reverberation time (RT60) values for the full octave bands with centre frequencies 500Hz and 1 kHz be in accordance with AS/NZS 2107:2000 given the usage of each space.

#### 4.5.3.4 Public Address Systems within Passenger Station Areas

Section 13.7.4 of the SWTC states that:

*The Alliance must ensure that the PA systems achieve the minimum sound level and speech intelligibility requirements of clause 4.3.4 and 4.3.6 of AS 1670.4 for all representative locations, environmental conditions and passenger levels*

*External noise ingress from adjacent road traffic sources must be assessed and considered when designing and constructing all stations to ensure that the public address systems within passenger station Areas achieve the minimum sound level and speech intelligibility requirements of clause 4.3.4 and 4.3.6 of AS 1670.4 for all representative locations, environmental conditions and passenger levels.*

#### 4.5.3.5 Acoustic Sound Insulation within Passenger Station Areas

Section 13.7.5 of the SWTC states that:

*Airborne sound insulation targets are given in terms of the weighted level difference, Dw between two spaces. The Alliance must ensure that design complies with the following general in-situ airborne sound insulation targets:*

- *Dw ≥ 35dB between normally occupied enclosed spaces.*
- *Dw ≥ 28dB between normally occupied spaces where the common partition includes a door.*

The following table presents criteria that supersede these general requirements for specific occupied spaces. Where two different space types are adjacent to one another, the Alliance must ensure that the more onerous target applies.

Table 3 Vibration criteria (SWTC Book 5 Table 31: Airborne Sound Insulation Requirements)

	Space Type / Occupancy	Minimum Weighted Sound Level Difference, Dw, dB
<b>Between normally occupied back of house offices and crib rooms</b>	Generally	40
	Where the common partition at the interface includes a door	30
<b>Toilets and amenities to nearby public areas</b>	Generally	42
	Where the common partition at the interface includes a door	25
	Where the common partition at the interface has no door	16

SWTC 13.7.5 also states that

*Where receiving spaces are not fully enclosed, the closest point of assessment must be at least 4 metres from the nearest door or window or the nearest scheduled seating position, whichever is closest.*

*Noise from hydraulic services associated with toilet amenities (e.g. flushing) must not be audible in any other publicly accessible area.*

*Noise from hand dryers within toilets and amenities should not be audible at any position more than 2 metres from the entrance, and must not be audible at any commercial retail or patron seating areas.*

## 4.6 Design Life

Not applicable.

## 4.7 Durability Requirements

Not applicable.

## 4.8 Specialist Technical Inputs

### 4.8.1 Public Address (PA) Systems

The public address system will need to be designed to be sufficiently audible (involving both sound level and speech intelligibility) to meet relevant provisions of Australia Standard 1670.4, Fire Detection, Warning, Control and Intercom Systems - System Design, Installation and Commissioning - Sound Systems and Intercom Systems for Emergency Purposes (AS 1670.4) such that patrons can be advised in case of emergencies.

By inspection of each station arrangement, supplied 'EASE' model outputs and distancing to the nearest residential receivers (screening assessment), it can be seen that there is a range of sound levels which can meet both the minimum sound level limit requirements of AS 1670.4 and the maximum noise level limits listed.

An active PA system which regulates speaker volume depending on actual ambient sound level conditions to maintain intelligibility is recommended for the Ellenbrook Station.

### 4.8.2 Crowd / Patron Noise

Average crowd and patron noise levels in the context of the design criteria and other environmental noise sources are considered insignificant.

The arrangement of the station has passenger waiting areas on the platform, busway waiting areas and pick up points at distances over 40 metres from residences and/or generously spaced open environments.

Providing this level of distance separation and low crowd densities is expected to ensure that any sustained crowd / patron noise levels (conversations, walking) as individually  $L_{Aeq} 60dB @ 1$  metre and therefore below  $L_{Aeq} 30dB @ 40$  metres will be at a cumulative level that is inaudible at nearby residential locations against other background environmental noise.

### 4.8.3 Vehicle Car Parking

EU Parking Area Noise 2007<sup>1</sup> guidelines have been used to provide an indicative level of noise emissions on surrounding areas.

- Vehicle movement rate for P&R facilities over 20km from CBD. A vehicle entering or exiting a parking bay is one movement, so the same vehicle arriving and departing on the same day completes two movements.
  - 0.30 per hour per parking bay (6am to 10pm).
  - 0.10 per hour per parking bay (10pm to 6am).
- Random fill across all parking lots.<sup>2</sup>

<sup>1</sup> Bayer, Landesamt für Umwelt 2007, Parking Area Noise - Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Storey Car Parks and Underground Car Parks, Bayerisches Landesamt für Umwelt, Parkplatzlärmstudie 6, Aufl., August 2007.

<sup>2</sup> Random fill assumed in the absence of a specific car parking traffic analysis. Fill patterns in practice may vary due to proximity to train station, and presence of ticketed parking and/or reserved parking.

- Impulse correction  $K_i$  4dB.
- $L_{w0}$  63dB (standardised vehicle sound power level).

#### 4.8.4 Bus movements

Bus vehicles have been modelled using Nord2000 methodologies with the following parameters:

- Changes in level from arriving / idling / departure at stations (as assessed at nearest noise sensitive location) have been determined insignificant and not modelled. Publicly accessible road sections beyond the loop or its intersections are not included.
- Ground class F (compacted dense ground).
- Category 2a vehicles (up to 12.5m length and 2 axles, e.g. Volgren OC500LE), approximately  $L_{Amax}$  75dB,  $L_{AE}$  78dB at 7.5m and 35km/hr.
- Traffic case F (35km/hr max).
- Asphalt concrete surface, any increases in noise level due to gradients was included on the basis of the ground topography provided.

#### 4.8.5 Noise Propagation Effects

##### 4.8.5.1 Path Attenuation Factors

Outside the rail reserve, the environmental factors relevant to noise propagation were modelled as follows:

- Topography dataset of existing conditions for the assessment area was sourced from Landgate and adapted to the provided alignment in 3D dwg format.
- Given the relatively short propagation distances, weather conditions for each time period were considered neutral, with 20°C ambient temperature and no prevailing wind or temperature gradient effects.
- Existing noise barrier and fence heights and locations were reviewed with necessary corrections being made to reflect their realistic existing conditions. The modelling was then carried out on the basis that these fences and barriers are acoustically solid, i.e. they perform as effective noise barriers, being of suitable construction to sufficiently reduce noise transmission.

##### 4.8.5.2 Air Attenuation and Diffraction

The propagation of railway noise from source to nearby sensitive areas has been estimated using industry standard numerical code that has been validated through field measurements.

- 'N2k': The Nord2000 Rail prediction method is an update to the Kilde formulation based on advancements in the late 1990s. The main benefit comes from the fact that the N2k methodology calculates in terms of one-third octave bands, rather than a single number to represent all frequencies. This is critical in regards to the design of noise walls, because their effectiveness is strongly frequency dependent – the difference in noise reduction at higher frequencies is vastly different compared to low frequencies.
- The ISO 9613 Industrial Prediction Model has been used for predicting noise from stationary assets with noise sources including sirens and bells. Various weather conditions can be taken into account in this modelling algorithm.

Stationary noise sources are modelled according to the parameters outlined in the following Table.

Parameter	Day period	Night period
Wind speed	Nil (ISO 9613, $C_{met} = 0dB$ )	Nil (ISO 9613, $C_{met} = 0dB$ )
Temperature inversion lapse rate	Nil (ISO 9613)	Nil (ISO 9613)
Temperature	20°C	15°C

<b>Relative humidity</b>	50%	50%
<b>Mean barometric pressure</b>	1013hPa	1013hPa

These sources are generally those assessed under the Regulations, such as crowd noise, public address systems, fixed mechanical plant and idling buses not on public roads.

#### 4.8.5.3 Ground absorption

The table below summarises the ground absorption rates modelled.

Parameter	Value	Comments
<b>Default</b>	0	Hard ground
<b>Rail reserve generally</b>	0	Hard ground
<b>Undeveloped sites, loose soil</b>	0	Conservatively assuming future development / sealed surfaces
<b>Significant road and sealed concrete surfaces</b>	0	Conservatively 100% hard reflective
<b>Established parks and reserves</b>	0.6	60% sound absorptive

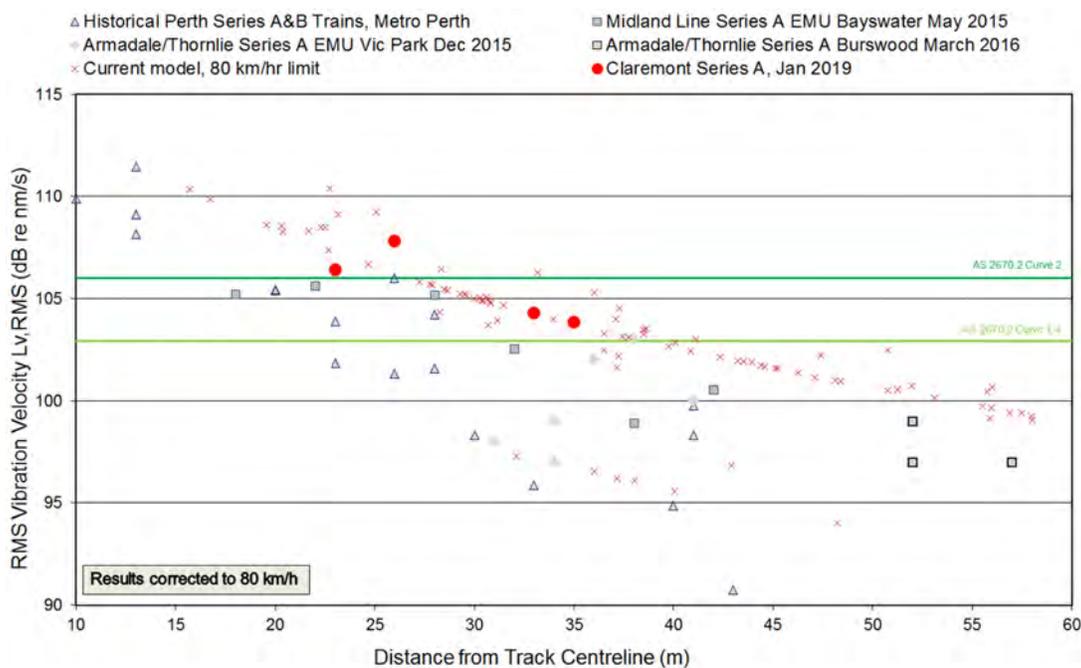
The following table shows the noise levels of the passenger trains as ascertained at a distance of 15 m from the rail tracks as well as the correction coefficients determined for the passenger trains using the Perth rail network.

#### 4.8.6 Vibration source levels

Vibration emissions from the site will be mainly controlled by rail traffic. Road vehicles will also contribute where speed humps, loose panels (e.g. gutter or pit covers) or sudden variations in road surface are introduced.

This assessment acknowledges that typical rail vibration levels in the immediate area will decrease from corresponding decreases in rail speeds when all trains stop at Ellenbrook (rather than pass through the area at or near the track section limit).

On a number of previous projects in Perth, ground vibration measurements have been carried out by SLR adjacent to surface rail track carrying passenger trains at a variety of distances from the rail centreline at each site.



Adjusting for speeds around 40 km/hr, which would be the highest speed that could be expected in the vicinity of the station, typical vibration levels will comply with Curve 1.4 at approximately 30m from the nearest track centreline. Curve 2 will be complied with at approximately 20m from the nearest track centreline.

Actual results will vary from these estimates according to in situ soil and terrain profiles; however allowing for such variation and that trains will stop, vibration levels are expected to be compliant.

On the basis of the above, the project provisions for vibration controls may be limited to avoiding road speed humps and loose coverings for buses and heavy vehicle traffic.

#### 4.9 Constructability Requirements

Not applicable.

#### 4.10 Environmental & Sustainability Design Criteria

Not applicable.

#### 4.11 Future Proofing

Not applicable.

#### 4.12 Value Engineering

Not applicable.

#### 4.13 Third Party Operational Stakeholders

Not applicable.

#### 4.14 Design Input from Stakeholders and Community Involvement Process

Not applicable.

#### 4.15 Design Risks, Assumptions, Issues, Dependencies, Opportunities, and Constraints (RAIDOC)

Detailed of design risks, assumptions, issues, dependencies, opportunities and constraints are outlined below.

#### 4.15.1 Design Risk Register

Design risks related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Not applicable at this design stage		

#### 4.15.2 Design Assumptions

Design assumptions related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Rough / diffusive wall finishes. If walls are hard reflective, then wall extents may need to be revised.		
	Existing residential walls and noise walls relevant to the report outcomes are acoustically sound, continuous / without gaps.		

#### 4.15.3 Design Issues

Design issues related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Not applicable at this design stage		

#### 4.15.4 Design Dependencies

Design dependencies related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Noting Rail Systems Australia appears to have already constructed EASE models for Malaga and Ellenbrook (25-A-287-EC0151, 25-A-287-EC0152, 25-A-291-EC0151, 25-A-291-EC0152), responsibility for production of Speech Transmissibility Index (STI) contours and design of loudspeaker arrangements to be submitted as part of the various Station packages appears to rest with Rail Systems Australia.		

	Until directed to undertake such modelling as per agreement SK97/0018, SLR has not undertaken such calculations to independently verify these claims.		

#### 4.15.5 Design Opportunities

Design opportunities related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Not applicable at this design stage		

#### 4.15.6 Design Constraints

Design constraints related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
	Not applicable at this design stage		

### 4.16 **Requests for Information (RFI)**

Requests for information submitted in relation to this design package are outlined in the Table below. Copies of the RFIs are provided in Appendix W of this report.

RFI	Description/Title	Response
<b>062</b> <b>CRFI-SLR-PW-00001</b>	Noise and Vibration - Baseline Measurements	Closed
<b>063</b> <b>CRFI-SLR-PW-00002</b>	Noise and Vibration Assessments - Data Input Log / Requests	Closed
<b>068</b> <b>CRFI-SLR-PW-00003</b>	Conversion of federated model 25-B-00-0001.4.0.IFI to AutoCAD	Closed

## 5. **Design Outputs**

### 5.1 **Deliverables List**

Not applicable.

### 5.2 **Drawings and Models**

#### 5.2.1 Bus and car parking activities

The below figure gives an example of potential noise levels in the vicinity of the station as a result of modelled bus operations and car parking facilities according to Section 4.



Figure 8: Indicative distribution in airborne noise from station, bus and car parking areas for comparison with  $L_{Aeq}$  criteria

### 5.3 Specifications

A list of specifications for this design package is provided in Appendix B of this report, and will include rail web dampers and under ballast matting if considered requisite.

### 5.4 Standard Reference Drawings

Not applicable.

### 5.5 System Coordination Drawings and Models

Not applicable.

### 5.6 Type Approvals

Not applicable.

### 5.7 Calculations

Not applicable.

### 5.8 Schedules

Not applicable.

## 6. Competence for Design

Not applicable at this Design Stage.

## 7. Design Reviews and Certification

### 7.1 Interdisciplinary Design Check (IDC) Review

Not applicable at this Design Stage.

### 7.2 IDC Certificate

Not applicable at this Design Stage.

### 7.3 Design Verification

Not applicable at this Design Stage.

### 7.4 Independent Verification

Not applicable at this Design Stage.

### 7.5 BCA

Not applicable at this Design Stage.

### 7.6 DDA

Not applicable at this Design Stage.

### 7.7 PTA Design Submission Reviews.

Not applicable at this Design Stage.

## 8. Design Compliance

The demonstration of compliance with the requirements of the Project Definition Documents, including any non-conformances of concessions is summarised on the following sections.

### 8.1 Standards & Guidelines

Not applicable at this Design Stage.

### 8.2 SWTC

Not applicable at this Design Stage.

### 8.3 Planning & Environmental Approvals

Not applicable at this Design Stage.

### 8.4 Third Party Requirements

Not applicable at this Design Stage.

### 8.5 Deviation Register

Not applicable at this Design Stage.

### 8.6 Non-Compliances Register

Not applicable at this Design Stage.

## **9. External Interface Work Packages**

### **9.1 Project Interface Control Plan**

Not applicable at this Design Stage.

## **10. Effects of the Works**

Not applicable.

## **11. Safety in Design**

### **11.1 Overview**

Not applicable.

### **11.2 Systems Safety Assurance Plan.**

Not applicable.

### **11.3 Compliance with Safety Assurance Plan**

Not applicable.

### **11.4 Safety Analysis**

Not applicable.

### **11.5 Safety Argument**

Not applicable.

### **11.6 Hazard Analysis**

Not applicable.

### **11.7 Satisfaction of Safety Integrity Level Targets**

### **11.8 Satisfaction of GSN Requirements**

Not applicable.

### **11.9 Management of Safety Requirements**

Not applicable.

### **11.10 Transfer of Residual Risks and Safety Related Operational Conditions**

Not applicable.

### **11.11 Safety Assurance Statement**

Not applicable.

## **12. Systems Engineering**

### **12.1 Sub-system Allocation**

Not applicable.

### **12.2 Requirements Management**

Not applicable.

### **12.3 Engineering Assurance Summary**

Not applicable.

## **13. Sustainability in Design**

Not applicable.

## **14. Testing & Commissioning Requirements**

Not applicable.

### **14.1 ITP's**

Not applicable.

### **14.2 Hold Points**

Not applicable.

### **14.3 Witness Points**

Not applicable.

## **15. Human Factors**

Not applicable.

## **16. Reliability, Availability and Maintainability (RAM)**

### **16.1 General RAM Provisions**

Not applicable.

### **16.2 RAM Targets**

Not applicable.

## **17. Construction Methodology**

### **17.1 Construction Methods**

Not applicable.

### **17.2 Operational Staging**

Not applicable.

### **17.3 Works in Track Occupancies**

Not applicable.

## **18. Asset Maintenance Strategy**

Not applicable.

### **18.1 RTO Assets**

### **18.2 Other Assets**

Not applicable.

## 19. Asset Operations Strategy

The following operational strategy has been assumed in this design package:

### 19.1 Normal Modes of Operations

### 19.2 Degraded Modes of Operations

## 20. Decommissioning Strategy

Not applicable.

### 20.1 Capability to Modify

### 20.2 Decommissioning Strategy

## 21. Project Actions Register

A list of outstanding issues and assumptions that may affect the design are outlined in the Table below.

ID	Outstanding Issues	Potential Effect	Status
	Final arrangement of loudspeakers / PA systems	Increased noise emissions	

## Appendix E - Traffic Modelling



## METRONET Stage 1: Morley-Ellenbrook Line

### Ellenbrook Station Transport Impact Assessment

MEL-MLCX-MO-RPT-00006

Rev	Date	Purpose of Issue	Prepared	Reviewed	Approved
A	08/07/2021	Issued for Review	Jason Hoad Joshua Bandi	Daniel Beresford (JAV SRE)	Manoj Aravind (SEM)



Document Details	
<b>Project</b>	METRONET Stage1: Morley-Ellenbrook Line
<b>Client</b>	Public Transport Authority
<b>PTA Contract Number</b>	PTA200001
<b>Laing O'Rourke Project No.</b>	K97

**Document revision history**

Rev	Date	Purpose of Issue	Sections revised	Reason for updates
A	08/07/2021	Issued for review	N/A	N/A

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## Glossary

Phrase	Meaning	Notes
ACROD	Australian Council for Rehabilitation of Disabled	ACROD bays are specifically designated bays for those with disabilities who qualify for the ACROD parking program
DA	Development Application	The required statutory application for individual developments on a parcel of land that go beyond the remit of a simple building application to the local government
DOS	Degree of saturation	A percentage measure of demand/capacity for an intersection, approach or lane
DPLH	Department of Planning, Lands and Heritage	The WA state government department responsible for land-use planning
KnR	Kiss and Ride	Pick-up/drop-off facility for the train station
LOS	Level of service	A categorisation of the delay vehicles experience at a particular intersection, approach or lane
MEL	Morley-Ellenbrook Line	The proposed train line connecting from Bayswater to Ellenbrook as a spur line from the existing Midland line
PCU	Passenger Car Unit	A unit to measure the equivalent number of passenger cars represented by vehicles larger than a passenger car
PDO	Property Damage Only	A crash that causes damage only to property (built form or vehicles for example), with no harm caused to people
PDP	Project Definition Phase	The concept design phase of the Morley Ellenbrook Line
PnR	Park and Ride	All-day parking facility for the train station
PUDO	Pick-up/drop-off	Pick-up/drop-off parking bays typically have a maximum 5 minute parking time
PSP	Principal Shared Path	A wide (>3 metre) shared path, usually with lighting and priority or signalised crossings at road crossings
SCATS	Sydney Coordinated Adaptive Traffic System	The control system used for all traffic lights within Western Australia
STEM	Strategic Transport Evaluation Model	The Department of Transport's multi-modal strategic transport model, used to forecast and assess transport demands in the Perth Metropolitan area
SWTC	Scope of Works and Technical Criteria	The documentation outlining the scope and criteria for the design and construction of the MEL project
TIA	Transport/Traffic Impact Assessment	An assessment report of the impact that a development or subdivision has on the surrounding transport network
WAPC	Western Australian Planning Commission	The section of the DPLH responsible for assessing statutory planning applications such as Development Applications

## Summary

As Perth grows, so does the need for rail infrastructure and METRONET is a critical element of the State Government's infrastructure agenda. The Morley-Ellenbrook Line (MEL) Project will improve connectivity between the north east metropolitan area and the rest of the city and unlock economic development in these local community areas.

Ellenbrook Station has been identified by METRONET and key stakeholders as a significant transit hub in connecting the Ellenbrook area by mass transit to Perth CBD and other major centres in the Perth Metropolitan area. The station provides a significant point of transport access for residents in an identified congestion problem area. This provision of this station provides a high speed alternative transit mode for Ellenbrook residents, which until this point are highly reliant on road transport. The provision of this rail station is especially important in the context of the growth expected in Ellenbrook and the North-East Growth corridor – which, as outlined in the *Swan Urban Growth Corridor Sub-Regional Structure Plan*, is expected to have a population in excess of 33,000 by 2035.

In accordance with the *WAPC Transport impact assessment guidelines*, this report provides an overview of the Transport Impact for the proposed Ellenbrook Station, comprising an assessment of the site's existing and future transport context, covering changes to the network, integration with surrounding land uses and an analysis of the development's traffic impact. This station is assessed to generate over 100 vehicles per hour during the peak hour, and as such is classified as 'high impact' under the guidelines, necessitating a Transport Impact Assessment.

Ellenbrook Station is proposed to be located at grade near the Ellenbrook town centre and is bounded by Civic Terrace, Cussington Way, The Parkway and Verdant Vista. A majority of the land on which the station is proposed is undeveloped, and zoned *special use or regional reserve – public purposes*.

At opening day (proposed by year 2024). Ellenbrook Station is proposed to consist of:

- One island platform (accessed at-grade from the station building)
- A 12-stand bus interchange comprising of:
  - 10 standard bus bays
  - 2 articulated bus bays

- Plus 6 layover bays (4 standard, 2 articulated)
- A 487 car bay Park and Ride (PnR), split across each side of the station comprising:
  - 445 standard all-day bays
  - 13 standard short-term bays
  - 1 tenant bay
  - 2 EV charging bays
  - 10 ACROD bays
  - 2 service vehicle/loading bays
  - 4 open staff parking bays
  - 10 secured (fenced) staff parking bays
- A 15 bay Kiss and Ride (KnR) facility comprising:
  - 13 standard pick-up/ drop-off (PUDO) bays
  - 1 accessible PUDO bay
  - 1 taxi PUDO bay
- 10 sheltered motorcycle bays
- Two secure bicycle storage shelters, with storage for up to 128 bicycles
- 16 bicycle 'u' rails.

The site is situated in the Ellenbrook Town Centre, with the surrounding land-use either being existing or proposed mixed-use development. The station is located a short distance from key trip attractors including the Ellenbrook Secondary College, Ellenbrook Library and Ellenbrook Central Shopping Centre.

An assessment of the impacts of the generated trips on the surrounding road network has been based on the combined traffic generated by the PnR/ KnR facilities, the development and background traffic growth in the area using SIDRA intersection software. Forecasting relied on data from the Department of Transport's STEM model. Trip generation for the site, including proportions of trips generated in the peak hour was based off benchmarking data provided by PTA. The results of this forecasting and trip generation can be seen in tables S1 and S2.

This assessment indicated that the traffic generated by the station did not result in major impacts to the surrounding road network – however two recommendations have been made to assist with traffic in the area for future years.

Overall, this TIA it is shown that the station is to be well serviced by the existing and proposed upgrades to the surrounding transport network, facilitating safe and convenient access for pedestrians, cyclists, buses and general vehicles.

Table S1: Ellenbrook Station Generated traffic demand – PnR and KnR facilities

Peak	PnR demand (veh/ %)		KnR demand (veh/ %)		Total (veh)	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
AM peak hour	295 (59%)	0	285 (57%)	285 (57%)	580	285
PM peak hour	0	187 (37%)	136 (27%)	136 (27%)	136	323

Table S2: Ellenbrook Station PnR and KnR traffic distribution

Associated STEM year	Distribution of Inbound traffic		Distribution of Outbound traffic	
	From North	From South	To the North	To the South
AM Peak - 2026 onwards	74%	26%	85%	15%
PM Peak - 2026 onwards	76%	24%	91%	9%



Figure S1: Ellenbrook Station 3D Model (PTA flythrough)

# 1 Introduction and background

## 1.1 Overview

### Acknowledgement of Country

MELConnx acknowledges the Whadjuk People of the Noongar Nation as the Traditional Custodians of the land and waters on which the Morley-Ellenbrook Line Project is located. We pay our respects to their Elders, both past and present and thank them for their continuing connection to the country, culture and community

### 1.1.1 METRONET vision and objectives

As Perth's single largest investment in public transport, METRONET will transform the way people commute and connect. It will create jobs and business opportunities and stimulate local communities and economic development to assist communities to thrive. The METRONET vision is for a well-connected Perth with more transport, housing, and employment choices.

In delivering METRONET, the WA Government has considered peoples' requirements for work, living and recreation within future urban centres with a train station at the heart.

The objectives are to:

- Support economic growth with better connected businesses and greater access to jobs
- Deliver infrastructure that promotes easy and accessible travel and lifestyle options
- Create communities that have a sense of belonging and support Perth's growth and prosperity
- Plan for Perth's future growth by making the best use of our resources and funding
- Lead a cultural shift in the way government, private sector, and industry work together to achieve integrated land use and transport solutions for the future of Perth.

### 1.1.2 Morley-Ellenbrook Line overview

As Perth grows, so does the need for rail infrastructure and METRONET is a critical element of the State Government's infrastructure agenda. The Morley-Ellenbrook Line (MEL) Project will improve connectivity between the north east metropolitan area and the rest of the city and unlock economic development in these local community areas.

The Public Transport Authority (PTA) is the lead agency delivering the MEL Project, with Main Roads WA (MRWA) undertaking some enabling works.

### 1.1.2.1 Project features

Transport infrastructure works for the Project include:

- A 21km rail line spurring from the Midland Line east of Bayswater Station, travelling north in the Tonkin Highway median, east through land north of Marshall Road and north on the western side of New Lord Street into Ellenbrook
- Stations at Morley, Noranda, Malaga, Whiteman Park and Ellenbrook with future-proofing for a station at Bennett Springs East
- Parking and bus interchanges/ facilities at stations
- Significant grade separations at key road crossings
- Underpasses to allow the rail line to enter and exit the Tonkin Highway median
- Principal Shared Paths (PSP) for walking and cycling access along the rail line
- Track and associated infrastructure to connect to the existing Midland Line
- Road and bridge reconfiguration works
- Integration across the packages of works and other nearby projects.

### 1.1.2.2 General scope of works

The Project's general scope of works includes the design and delivery of rail infrastructure and ancillary works to support operational passenger rail between Bayswater and Ellenbrook, including stations with inter-modal bus and rail with parking and associated road works at Bayswater, Morley, Noranda, Malaga, Whiteman Park and Ellenbrook stations.



Figure 1: Morley-Ellenbrook Line © METRONET

The Project activities include all investigation, design, approvals, construction, testing and commissioning, Entry Into Service (EIS), training and operational readiness required to incorporate the new railway to Ellenbrook, and tie into the existing network including the associated road, utilities and other required works to interface with adjacent works and contracts. This will include bulk earthworks and retaining, structures, grade separations, roads, and drainage.

The design and delivery of the main works package for the Project is broken into three distinct stages:

- Alliance Development Stage
- Project Alliance Reference Design Stage
- Project Alliance Delivery Stage (Detailed Design through to Project close-out).



Figure 2: Architect's Impression of Ellenbrook Station © MELConnx

### 1.1.2.3 Key project objectives, key compliance objectives and critical success factors

The PTA and MELConnx's single Non-Owner Participant (NOP) Laing O'Rourke Construction Australia Pty Ltd, have formed an integrated, collaborative Project Alliance to successfully deliver rail infrastructure that reflects our absolute commitment to achieving the Project Objectives and delivering positive outcomes for the State.

The following image demonstrates how we have mapped each Key Project Objective in the Project Alliance Agreement (PAA) against the Critical Success Factors to achieve best-for-project outcomes, underpinned by the Key Compliance Objectives.

Key Project Objectives	Critical Success Factors for Successful Project Delivery (abbreviated)			
<b>Implementation of a robust, cooperative team culture.</b>	<ul style="list-style-type: none"> <li>Development of a culture that results in all Participants developing behavioural values and driving principles to achieve Alliance goals and project objectives</li> <li>Longevity and stability of key Alliance personnel i.e. Alliance Manager, ALT and AMT.</li> </ul>			
<b>Timely delivery of Works to achieve project milestones in accordance with agreed program.</b>	<ul style="list-style-type: none"> <li>Development of a final proposal with a sufficiently developed design and accurate TOC</li> <li>Subsequent cash flow management and financial forecasting, scheduling and value-earned calculation and determination</li> <li>Implementation of PTA mandated systems i.e. TeamBinder, Primavera P6, TILOS and a finance system accepting the PTA's cost breakdown structure</li> <li>Timely completion of design, construction and commissioning through to practical completion</li> <li>Timely progress towards construction milestones and completion of close-out to achieve final asset acceptance compliance.</li> </ul>			
<b>Inclusion of processes that embrace/promote open tendering and promotion of work package development that encourages/enables second and third tier tendering.</b> <b>Compliance with WAIPs.</b>	<ul style="list-style-type: none"> <li>For professional service providers, implement a proven and mature supply-chain engagement process, including tender review, contract award and project integration. Ensure that it offers opportunity and security of payment relative to services delivered in an effort to achieve best-for-project outcomes</li> <li>For material suppliers and other subcontract service providers, implement a proven and mature supply-chain engagement process, including tender review, contract award and project integration that offers opportunity and security of payment relative to service delivered</li> <li>Proven and mature supply-chain engagement process for labour hire services, compliant with industrial and safety laws, maintained employee standards/conditions and security of employee payments</li> <li>Ability to develop contracts and terms and conditions in the spirit of the Alliance values and principles, appropriate and commensurate with the size, complexity and value of packages in accordance with industry best practice.</li> </ul>			
<b>Optimisation of operational and whole of life costs.</b>	<ul style="list-style-type: none"> <li>Sustainability considerations and outcomes for the whole of life of the works.</li> </ul>			
<b>Ensuring appropriate consultation/integration with stakeholders and community.</b>	<ul style="list-style-type: none"> <li>Constant and effective engagement with relevant stakeholders, particularly utilities/services, Main Roads, third party asset owners and relevant unions</li> <li>Effective management of PTA interfaces and PTA contractors</li> <li>Constant/effective engagement with the PTA in design reviews, work planning and possessions/shutdowns.</li> </ul>			
<b>Providing passengers with safe and secure services and facilities.</b>	<ul style="list-style-type: none"> <li>Compliance with ONSR requirements</li> <li>Completed rail line, stations and bus transfer infrastructure are able to deal successfully with the movement of people, including the disabled.</li> </ul>			
<b>Minimising disruption to current and anticipated rail operations.</b>	<ul style="list-style-type: none"> <li>Minimise impact on public transport services disruption</li> <li>Liaison and interaction with PTA rail operations personnel tasked with determining network closures, to confirm available network shutdowns and implement contingency plans</li> <li>Effective management of interfaces with others in heavily constrained areas</li> <li>Effective management/staging of works to reflect staged/constrained site access</li> <li>Effective management of existing rail infrastructure asset protection.</li> </ul>			
<b>Recognising the State's desired industrial relations objectives.</b>	<ul style="list-style-type: none"> <li>Develop a project-specific Industrial Relations Management Plan based on a proven and successful industrial relations approach that delivers a collaborative worksite, genuine collective agreement, making good faith in negotiations and dispute resolution, and respect for trade union rights of entry.</li> </ul>			
<b>Key Compliance Objectives (abbreviated)</b>				
Compliance with all Statutory requirements and State Government policy requirements for construction work.	Compliance with the SWTC.	Protecting and minimising disruption to all existing facilities, infrastructure, properties or public utility services.	Meeting all obligations to impacted stakeholders and demonstrating genuine sensitivity.	Compliance with all environmental conditions and minimise adverse environmental impact.

Figure 3: Key Project objectives, Critical Success Factors and Key Compliance Objectives

### 1.1.3 Alliance vision and delivery approach

The MEL Project will be delivered under an alliance contract to support the management of project and stakeholder interfaces and to mitigate project risks. A collaborative alliance approach will see the Works carried out in a cooperative, coordinated, and efficient manner in compliance with the Alliance Principles.

MELConnx understands that the successful delivery of the Project is critically linked to meeting the PTA's Key Project Objectives. These objectives have shaped our vision for the Project

that is around delivering a high-quality product and creating exceptional value-for-money. We are committed to a no-blame culture and to the prompt and mutual resolution of any issues that may arise.

During the AD Stage, representatives from both the PTA and MELConnx participated in an interactive workshop to begin the process of developing a suitable Alliance Vision for the Project (refer Figure 4 below for workshop outcomes).



Figure 4: AD Stage Alliance Vision Development Outcomes (developed with the PTA)

The Alliance Foundation workshop was held on 11/11/2020 and the results of this workshop generated the basis for the Vision, Purpose,

Values and Behaviours Commitment Statements represented here.



Figure 5: MELConnx Alliance Vision, Purpose and Values

## 1.2 Introduction

This report provides an overview of the Transport Impact Assessment for the proposed Ellenbrook Station situated on the Morley-Ellenbrook Line. The sections following comprise an assessment of the site's existing and future transport context, covering changes to the network, integration with surrounding land uses and an analysis of the development's traffic impact.

## 1.3 Development proposal

Ellenbrook Station has been identified by METRONET and key stakeholders as a significant transit hub in connecting the Ellenbrook area by mass transit to Perth CBD and other major centres in the Perth Metropolitan area. The station provides a significant point of transport access for residents in an identified congestion problem area. This provision of this station provides a high speed alternative transit mode for Ellenbrook residents, which until this point are highly reliant on road transport.

Ellenbrook Station is proposed to be located at grade near the Ellenbrook town centre and is bounded by Civic Terrace, Cussington Way, The Parkway and Verdant Vista. A majority of the land on which the station is proposed is undeveloped, and zoned *special use or regional reserve – public purposes*.

As per Figure 7 (right), at opening day (proposed by year 2024). Ellenbrook Station is proposed to consist of:

- One island platform (accessed at-grade from the station building)
- A 12-stand bus interchange comprising of:
  - 10 standard bus bays
  - 2 articulated bus bays
  - Plus 6 layover bays (4 standard, 2 articulated)
- A 487 car bay Park and Ride (PnR), split across each side of the station comprising:
  - 445 standard all-day bays
  - 13 standard short-term bays
  - 1 tenant bay
  - 2 EV charging bays
  - 10 ACROD bays

- 2 service vehicle/loading bays
- 4 open staff parking bays
- 10 secured (fenced) staff parking bays
- A 15 bay Kiss and Ride (KnR) facility comprising:
  - 13 standard pick-up/ drop-off (PUDO) bays
  - 1 accessible PUDO bays
  - 1 taxi PUDO bays
- 10 sheltered motorcycle bays
- Two secure bicycle storage shelters, with storage for up to 128 bicycles
- 16 bicycle 'u' rails

Figure 6 shows the current general layout of the Ellenbrook Station development, and Figure 7 shows an architectural concept render of the station building.

## 1.4 Key issues

Given the existing site is largely undeveloped, the introduction of a transit node connecting the surrounding area to high capacity public transport creates a crucial need for transport infrastructure upgrades in the station surrounds. In order to facilitate safe and efficient access to support the station, construction of some of the surrounding planned local roads, along with active transport infrastructure and feeder bus services is needed.

## 1.5 Background information/previous studies

A number of studies have been completed or under development within the surrounding station precinct and along the wider Morley-Ellenbrook Line, including the following:

- Swan Urban Growth Corridor Sub-Regional Structure Plan (2009)
- Perth & Peel @ 3.5 million – North-East Sub-Regional Planning Framework (2018)
- MEL Engineering and Land Use Planning (ELUP) study (2018)
- MEL Project Definition Phase (2019-20)
- MEL TSAP Stage 1 Traffic Modelling Study (2020-21)

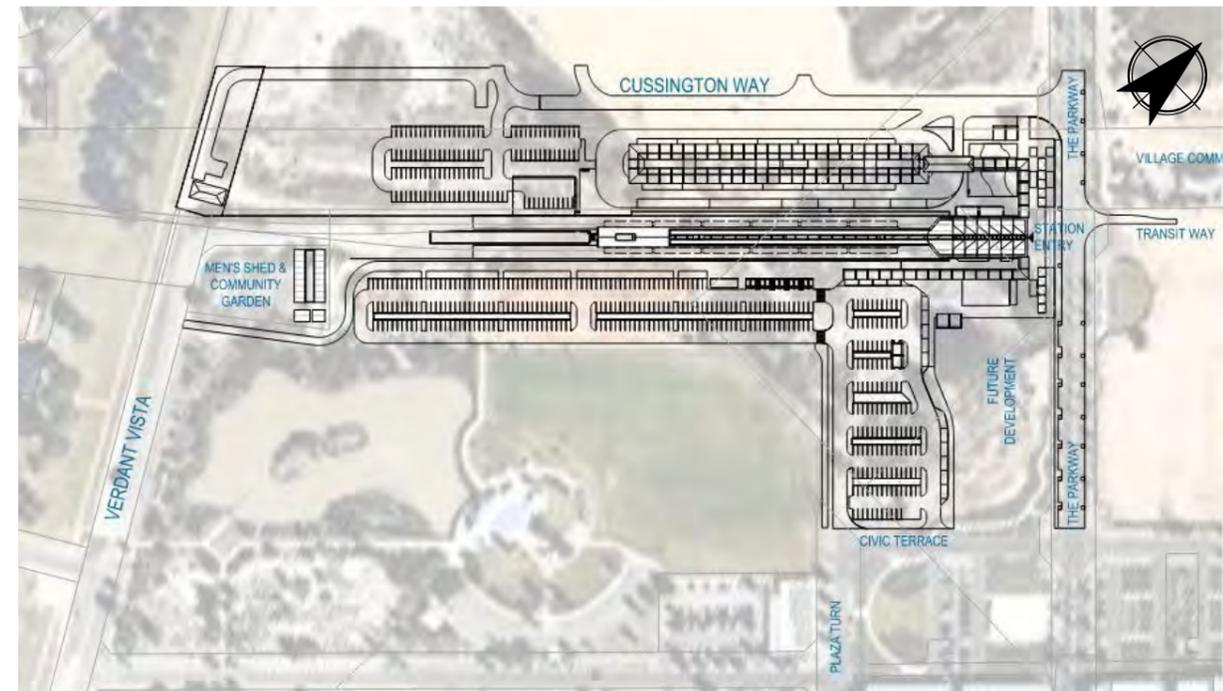


Figure 6: Ellenbrook Station overall location plan (25-A-291-AR0012, PTA)

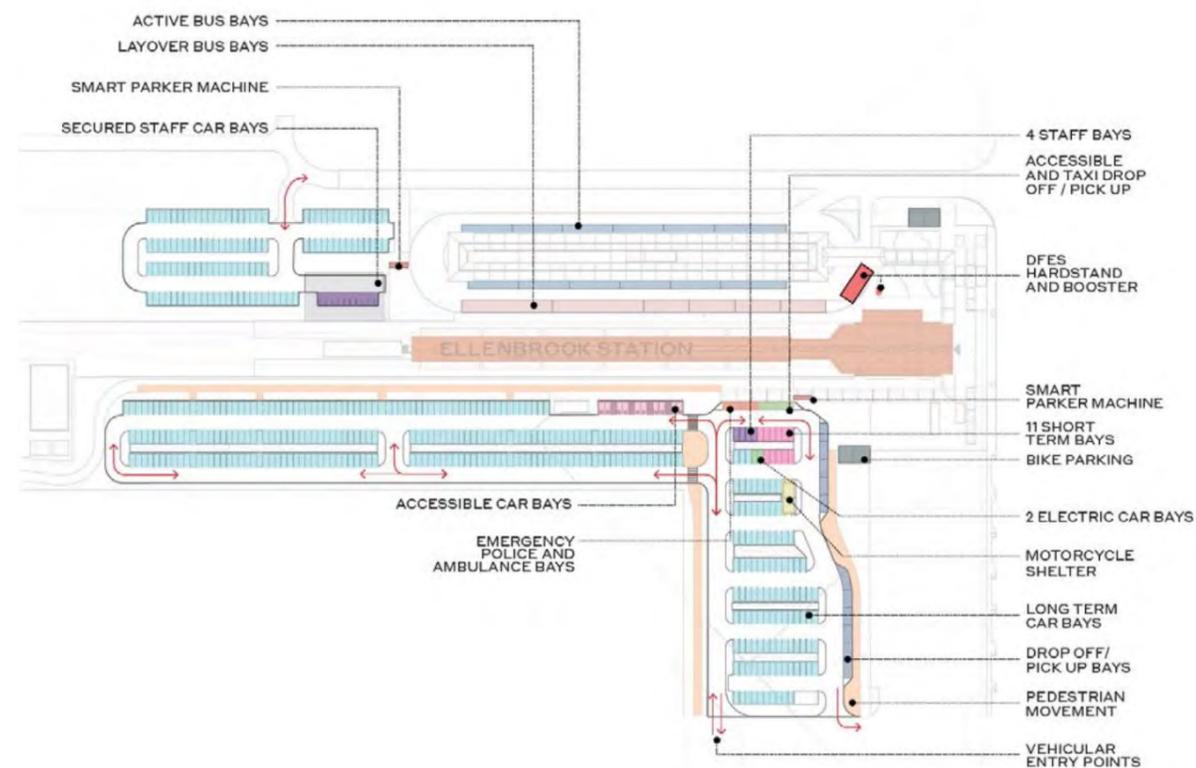


Figure 7: Ellenbrook Station parking provisions (Source: MEL-MLCX-AR-RPT-0001, PTA)

## 2 Existing context

To understand the transport impact of the proposed Ellenbrook Station, it is important to understand the existing operation and condition of the surrounding active, public and private transport network. Ellenbrook Station will be constructed in the existing Ellenbrook town centre – which is an area with an existing, developed transport network. The town centre is partially developed – with a significant amount of undeveloped lots. Understanding the current context will enable the identification of any existing constraints and opportunities that can be applied to the site and surrounding transport network.

This section of the report covers the following contextual aspects of the site in relation to its existing condition:

- Site uses
- Surrounding land use
- Access arrangement conditions for pedestrians, cyclists, buses and vehicles
- Traffic generation and intersection operation
- Crash data.

### 2.1 Site uses

The site is currently situated in an unoccupied brownfield area, with the only current land use being a BMX track. Due to the site vacancy, the site currently does not generate any significant trips within the area.

### 2.2 Surrounding land uses

All of the surrounding land use is zoned as *Special Use Zone 4* under the *City of Swan Local Planning Scheme No. 17*. This zoning covers a significant range of land-uses, which are elaborated in the *Ellenbrook Town Centre Development Plan*. These land uses are shown in Figure 8 (right).

A significant amount of the Town Centre land is currently undeveloped – in particular those in the immediate vicinity of the station which are proposed as mixed-use developments.

Existing developments of note are outlined below in reference to Figure 8:

- 1 Ellenbrook Central shopping centre
- 2 Ellenbrook Secondary College
- 3 Ellenbrook Library
- 4 Spudshed Ellenbrook
- 5 Bunnings Ellenbrook



Figure 8: Precinct Zoning Plan (source DP-5H: Ellenbrook Town Centre Development Plan)

### 2.3 Active transport provisions

A high-level summary of the existing pedestrian and cycling infrastructure surrounding the future station is provided in Figure 10 (right).

Currently there is a reasonably significant footpath network surrounding the station. On most of the developed roads in and around the Town Centre, there are footpaths on both sides of the road. Kerb ramps are provided at most intersections and some mid-block locations. Pedestrian crossing facilities are provided at all signalised intersections in the locale, in accordance with current traffic signal standards.

There is an existing Principal Shared Path network heading directly north-east from the station location, along the transit corridor reserve. This continues approximately 3.5kms into the northern portion of the Ellenbrook Suburb.

Some on-road cycle lanes/sealed shoulders have also been provided at the following locations:

- The Promenade
- The Broadway (north of The Promenade)

It should be noted that the City of Swan Cycle Network Plan contemplates a significantly more developed cycle network by 2051 – this can be seen in Figure 9 (below).

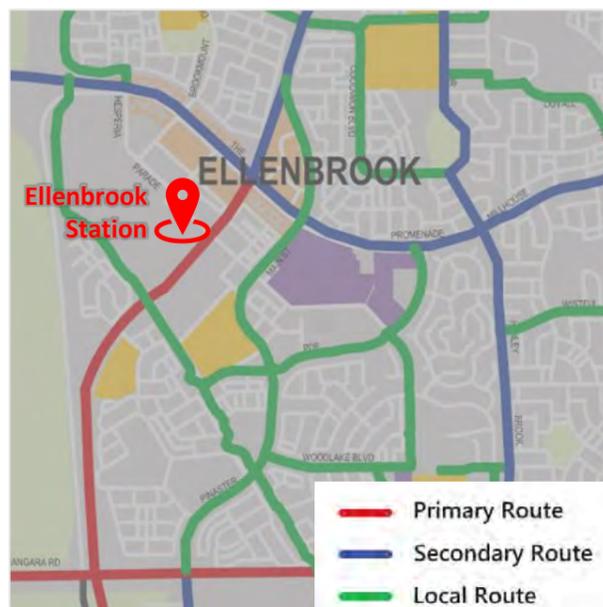


Figure 9: City of Swan Cycle Network Plan excerpt

### 2.4 Public transport provisions

A high-level summary of the existing public transport provisions surrounding the future station is provided in Figure 10.

Several existing bus routes service the Ellenbrook town centre area – all existing routes utilise Main Street as the central access spine for the town centre. A summary of these routes is provided below:

- **Route 334** – between Ellenbrook Central and Wyara Link, typical 30-minute headways in peak hours
- **Route 336** – between Henley Brook Bus Station and Wyara Link, typical 15-minute headways in peak hours.
- **Route 337** – between Henley Brook Bus Station and Ellenbrook Central (via Amethyst Parkway), typical 15-minute headways in peak hours.
- **Route 338** – between Henley Brook Bus Station and Ellenbrook Central (via Hancock Avenue), typical 15-minute headways in peak hours.
- **Route 955** – between Ellenbrook North and Morley Bus Station (via Bassendean), typical 10-minute headways in peak hours.



Figure 10: Existing active and public transport provisions

## 2.5 Vehicle provisions

### 2.5.1 Road network

The functional road hierarchy of key roads surrounding the site are summarised below and shown in Figure 11.

**Main Street** – Classified as a Local Distributor, Main Street provides access to and through the town centre, as acts as the primary shopping street in Ellenbrook. It consists of a single carriageway in each direction with a median, with turning lanes and pockets provided at some intersections. Main Street currently carries approximately 8,500 vehicles per day on a typical weekday and operates with a default 50km/h speed limit.

**The Promenade** – A dual carriageway Distributor B road generally running east-west. The Promenade serves as the main distributor road for Ellenbrook, connecting the suburb to Northlink (Tonkin Highway), West Swan Road, and surrounding suburbs of Aveley and The Vines. It currently carries about 19,000 vehicles per day and is posted at 60 km/h.

**The Parkway** – Classified as an access road, The Parkway carries approximately 3,750 vehicles per day on a typical weekday and operates with a default 50km/h speed limit.

**Pinaster Parade** – Classified as a Local Distributor, Pinaster Parade provides a link/bypass from The Promenade around the Town Centre. It consists of a single carriageway in each direction with a median. It is posted at 60 km/h.

### 2.5.2 Parking provisions

There are currently no parking provisions associated with the site. On street and off street parking exists in the surrounding area, servicing the existing land uses.

## 2.6 Existing intersections surrounding the site

Surrounding the site, the following existing intersections have been identified as being potentially impacted by the site development traffic.

**Main Street/Plaza Turn** is a priority controlled (give-way) T-junction, currently serving the Ellenbrook Library and local parklands. This will become one of the main accesses into the proposed Ellenbrook Station.

**Main Street/The Promenade** is a four-way at-grade signalised intersection primarily with two-lane approaches on each leg. This intersection also has pedestrian crossing facilities on all legs.

## 2.7 Crash data

Historical crash data (last five years, 2016-2020) has been summarised in the heatmap shown in Figure 11, and tabulated in Table 1 below. The data highlights that most crashes have occurred at intersections surrounding the site, principally Main Street/Commercial Avenue and Main Street/The Promenade. Midblock crashes on Main Street are also notable. The most prominent type of intersection crash were right angle crashes – which is typical of filter turn intersections. Sideswipe crashes were also notable at midblock locations, likely caused by issues with merging. It should be noted that crash severity in the study area was low, with only 3 hospitalisations and 19 medical crashes across the five years. A vast majority (81%) of crashes were PDO.

Table 1: Crash types at main surrounding intersections and midblock locations

Crash type	Main Street (midblock)	Library Avenue (midblock)	Main Street/Commercial Avenue	Main Street/The Parkway	Main Street/The Promenade	Main Street/ Ellen Stirling Parade
Rear end	4	1	1	5	8	1
Head on	0	0	0	0	0	0
Sideswipe	5	3	1	0	1	0
Right angle/right turn thru	1	1	17	4	18	4
Non-collision/other	1	0	0	1	0	0
Hit pedestrian	1	1	0	0	2	0
Hit object	2	0	0	0	0	0
<b>Total</b>	<b>14</b>	<b>7</b>	<b>19</b>	<b>10</b>	<b>29</b>	<b>5</b>



Figure 11: Functional road hierarchy and crash data



### 3.2 Proposed access arrangement

#### 3.2.1 Proposed pedestrian and cycling infrastructure

Station precincts have been designed to prioritise safe and easy movement for pedestrians throughout the area. As further mixed-use development occurs around Ellenbrook Station – complemented by expansion of the existing active transport network – pedestrian and cyclist journeys will become increasingly appealing.

The following improvements are proposed to facilitate pedestrian and cycle priority:

- Provision of a Principal Shared Path<sup>2</sup> (PSP) from Ellenbrook Station along the MEL line, tying into the Drumpellier Drive shared path.
- 128 secure bicycle parking bays split across two storage structures – proposed as double stacked racks (see Figure 13 below). This accounts for over 5% of the expected 2051 passenger boarding forecasts. These will utilise Transperth’s existing secure cycle storage system, requiring registration and use of a SmartRider card for access.
- 16 bicycle ‘u’ rails within the station plaza area
- Designated zebra crossings in both the PnR/KnR facilities and the bus interchange.
- Connections to the existing footpath network, including new pram ramps to provide crossing points on surrounding roads.



Figure 13: Double stacked cycle racks  
(Source: Velopa)

#### 3.2.2 Proposed public transport provisions

The introduction of Ellenbrook Station and MEL will provide a significant increase to public transport provisions in the proposed area. On opening day, Ellenbrook Station will provide direct rail access to the Perth CBD and the inner Midland line stations. It will also provide access to the greater Perth Metropolitan rail access.

Six services per hour (in each direction) are anticipated to operate during the peak periods of 7am – 9am and 4pm – 6pm. During the inter-peak periods, four services per hour (in each direction) are anticipated to operate, with approximately two services per hour in the evening hours (in each direction). The hours of operation for the MEL line and this station are planned to be 4:30am to 12:30am.

Given the anticipated demand for this rail service in Ellenbrook and the surrounding suburbs, a bus interchange at Ellenbrook Station is required in order to increase connectivity and improve access to the station for additional bus feeder services. These proposed bus service routes as indicated by the PTA, are shown in Figure 12 (page 11). Buses will access the interchange from The Parkway and the proposed new section of Cussington Way, as shown in Figure 14.

The interchange facility includes 12 active stands (10 standard and 2 articulated) and 6 layover stands (4 standard and 2 articulated).

The bus routes proposed to service the future Ellenbrook Station bus interchange will supercede the existing routes (334, 336, 337, 338 and 955). All bus stands located in the bus interchange are well within a 400m walk to the station entry building. Anticipated frequencies vary from 12 services per hour to three and are provided in more detail in Table 6 (page 14).

#### 3.2.3 Proposed vehicle access and parking

The station design has been undertaken to allow for station access for commuter and service vehicles, and for buses travelling to and from the bus interchange.

Access to the main ‘Park and Ride’ and ‘Kiss and Ride’ (labelled ❶ and ❷ in Figure 14 below) is provided from Civic Terrace/Plaza Turn. Vehicles accessing these facilities will either turn up Plaza Turn or The Parkway then Civic Terrace from Main Street.

Access to the northern, secondary, ‘Park and Ride’ (labelled ❸ in Figure 14 below) will utilise The Parkway and the new section of Cussington Way to access the facility.

Further details on private vehicle access routes and traffic volumes is provided in Section 4.

A summary of the parking provision across the facilities is provided in Table 2 below. This does not include the motorcycle parking shelter in PnR1, which provides 10 motorcycle parking bays.

Table 2: Summary of parking provision for Ellenbrook Station

Facility	Standard all-day bays	ACROD all-day bays	Standard short-term/PUDO bays	Accessible PUDO bays	EV charging bays	Taxi bays	Tenant parking	Service/loading bays	Staff parking (open)	Staff parking (secure)	TOTAL
PnR 1 ❶	332	10	13	-	2	-	1	2	4	-	364
KnR ❷	-	-	13	1	-	1	-	-	-	-	15
PnR 2 ❸	113	-	-	-	-	-	-	-	-	10	123

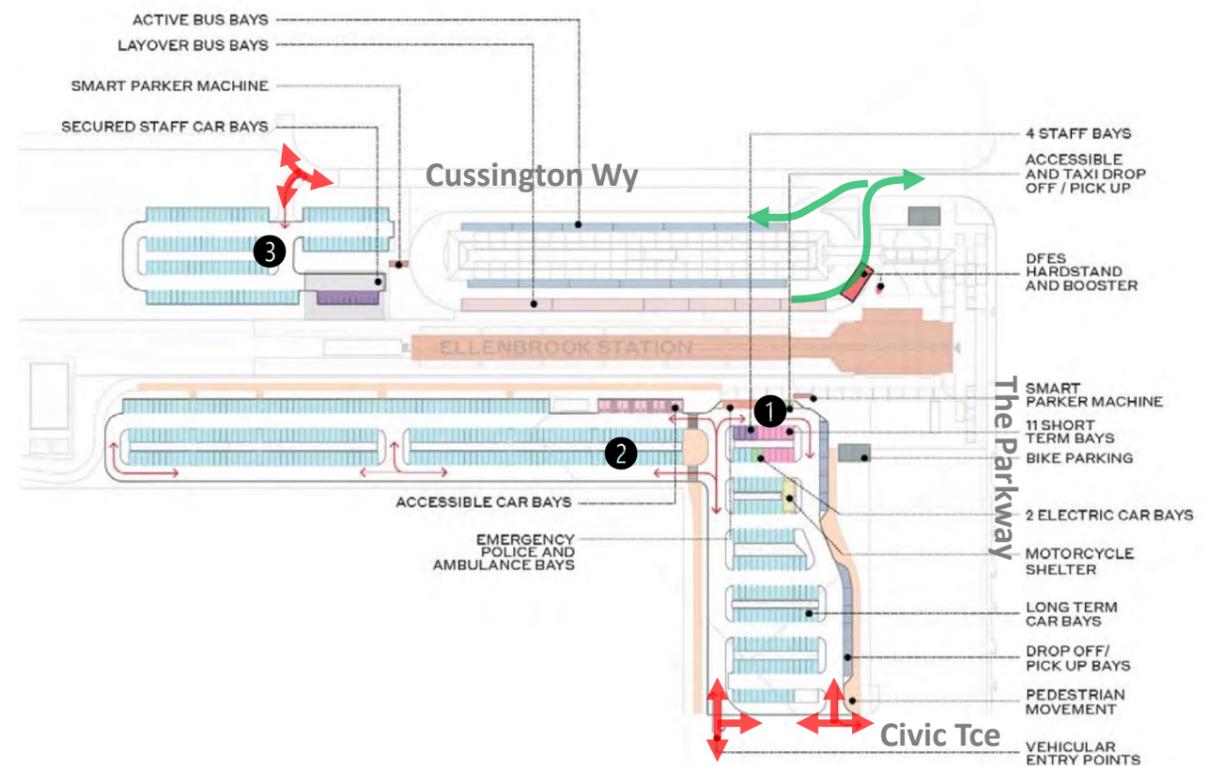


Figure 14: Ellenbrook vehicle access – car (red) and bus (green)

## 4 Traffic impact analysis

A local assessment of the surrounding network performance has been undertaken to assess the planned configuration of the future network with the proposed station access arrangements for each precinct, including Park n Ride, Kiss n Ride, and bus interchange access points. This analysis will also demonstrate high-level accessibility and safety considerations for active transport modes.

### 4.1 Assumptions and parameters

#### 4.1.1 Proposed site plan

Traffic modelling for Ellenbrook has been undertaken based on the proposed station configuration, as described in previous sections, and the likely impacts station generated traffic will have on the surrounding road network.

#### 4.1.2 Assessment years

The scenarios that have been investigated for the transport assessment on the proposed surrounding road network have included the following:

- 2019 AM/ PM peaks – Base modelling year

Project cases – completed as part of the base modelling assessment

- 2024 AM/ PM peaks – Opening year of Ellenbrook Station
- 2029 AM/ PM peaks – Opening of Ellenbrook Station +5 years
- 2034 AM/ PM peaks – Opening of Ellenbrook Station +10 years.

#### 4.1.3 Background future trip growth

Background traffic demands have been based on STEM (Strategic Transport Evaluation Model) link volumes on an all-day level. These all-day STEM link volumes have been provided for the following years:

- 2016 (Base)
- 2021
- 2026
- 2031
- 2041

Based on the all-day STEM link volumes the Main Roads WA Urban Road Planning (URP) approach

has been utilised to assess peak hour forecast volumes from all-day STEM forecasts. The step-by-step process used to determine the background traffic growth for each relevant year is detailed as follows:

1. Compare the all-day STEM 2016 and 2021 outputs using linear growth to create an all-day STEM 2020 demand (on a link level), adopted from STEM (MULFS v1.6.1)
2. Compare calculated all-day STEM 2020 to the all-day observed traffic volumes obtained from the video survey (on a link level) to identify the all-day flow differences for each link volume to obtain the calibrated STEM adjustment factor
3. Apply the calibrated STEM adjustment factor to the provided all-day STEM demands (on a link level). This creates an all-day project demand (on a link level)
4. Apply the identified peak one-hour factors (on a link level) based on 2020 video survey to the all-day project demands to create link volume AM and PM peak hour project demands
5. Apply the turning distribution as defined in the 2020 video survey, to the link AM and PM peak project demands, resulting in the AM and PM peak hour turning movements by approach.

Following consultation with the METRONET team, the traffic forecasts for the Ellenbrook Station precinct were endorsed on the 1<sup>st</sup> October 2020. These final demand forecasts have been provided within **Appendix A**.

### 4.2 Trip generation and distribution

#### 4.2.1 PnR/KnR traffic generation and distribution

The anticipated Park n Ride and Kiss n Ride traffic has been calculated based on the benchmarking of existing stations. Surveyed information collected for Clarkson Station on the 4th April 2011 between 5:00am – 10:00pm has been sourced as a comparison<sup>2</sup>. This station profile was utilised to understand the anticipated peak hour demand attributed to the Ellenbrook Station Park n Ride and Kiss n Ride due to the similar number of bays assumed at both stations and the similar distance to the Perth CBD.

The profile indicates that PnR demand rapidly increases in the morning, remains relatively unchanged between 8am and 2pm, and drops significantly in the evening between 3pm – 6pm. The findings of the benchmarked station profile analysis are described as follows:

- During the morning peak hour, the Park n Ride facility is expected to fill by approximately 59% of capacity. It is expected the remaining PnR capacity will fill during the rest of the AM peak period, which goes beyond a single hour.
- During the evening peak hour, the Park n Ride facility is expected to empty by approximately 37% of its capacity. It is expected the remaining PnR capacity will empty during the rest of the PM peak period, which goes beyond a single hour.

As a conservative assumption, the PnR peak inbound and outbound movements will coincide with the commuter peak and the facility will operate at capacity from opening day.

Table 3: Generated traffic demand – PnR and KnR facilities

Peak	PnR demand (veh/ %)		KnR demand (veh/ %)		Total (veh)	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
AM peak hour	295 (59%)	0	285 (57%)	285 (57%)	580	285
PM peak hour	0	187 (37%)	136 (27%)	136 (27%)	136	323

The traffic attributed to the station PnR and KnR facility has then been distributed based on all-day STEM Turning Volume Diagrams (TVDs) supplied by METRONET on 3rd August 2020. This allows

an understanding of where inbound and outbound traffic come from and go to within the peak period. This assumed station traffic distributions are shown within Table 4.

For KnR traffic, the profile for the benchmarked station has been utilised for the number of KnR traffic movements within each 15-minute time period between 5am-10pm.

- Analysis of the KnR morning and evening peaks have been calculated as a function of the benchmarked station PnR capacity. The findings of this analysis have been shown below.
- During the morning peak hour, the total trips within the Kiss n Ride is indicated to represent approximately 57% of the Park n Ride capacity.
- During the evening peak hour, the total trips within the Kiss n Ride is indicated to represent approximately 27% of the Park n Ride capacity.

Based on the benchmarked profile analysis, the additional PnR and KnR traffic for Ellenbrook Station is shown within Table 3. This demand is assumed to be consistent for all future modelling scenarios.

Table 4: PnR and KnR traffic distribution

Associated STEM year	Distribution of Inbound traffic		Distribution of Outbound traffic	
	From North	From South	To the North	To the South
AM Peak - 2026 onwards	74%	26%	85%	15%
PM Peak - 2026 onwards	76%	24%	91%	9%

<sup>2</sup> Use of 2011 benchmarking data was discussed and agreed with PTA and Main Roads at the time of modelling, as no more recent/relevant datasets were available, and it was expected that proportions would not significantly alter over time.

4.2.2 Public transport traffic

The bus forecasts provided have been updated from past assumptions outlined within the PDP planning stage for MEL, however, the final routes, services, and frequencies are still yet to be confirmed. The anticipated bus routes within the Ellenbrook Station road network as outlined here have been shown previously in Figure 12 on Page 11. The accompanying services and headways noted within Figure 12 have been summarised in Table 5.

4.2.3 Traffic flows

The distribution of vehicle classifications for the intersection is shown within Table 6 and Table 7.

These vehicle class percentages, along with the respective vehicle class passenger car equivalent (PCU) conversion factors outlined within the Main Roads WA Operational Modelling Guidelines have been used within the SIDRA modelling for each peak period scenario.

Peak period turning movement volumes within the road network for all future modelled scenarios have been summarised within **Appendix B**.

Table 5: Forecasted public transport – peak AM/ PM headway (mins)

Route number	Route	AM Peak Headway (minutes)		PM Peak Headway (minutes)	
		Northbound	Southbound	Northbound	Southbound
955 (existing)	Ellenbrook North to Morley Bus Station (via Bassendean)	20	30	30	30
W1	Ellenbrook Station to Whiteman Park Station (via Partridge Street)	10	10	10	10
W2	Ellenbrook Station to Whiteman Park Station (via Murray Road)	20	20	20	20
X1	Ellenbrook Station to Aveley North	-	60	-	-
X2	Ellenbrook Station to Aveley Secondary College	10	30	30	10
X3	Ellenbrook Station to Wyara Link (via Westgrove Drive)	30	20	30	20
X4	Ellenbrook Station to Wyara Link (via Brookmount Drive)	20	20	20	30
X5	Ellenbrook Station to Ellenbrook North	60	60	30	30

Table 6: Vehicle classification proportions – AM peak

Class	Vehicle classification (%) w/o buses											
	1	2	3	4	5	6	7	8	9	10	11	12
Class %	95.4%	0.9%	3.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
Group %	95.4%	4.3%			0.3%			0%			0%	0%

Table 7: Vehicle classification proportions – PM peak

Class	Vehicle classification (%) w/o buses											
	1	2	3	4	5	6	7	8	9	10	11	12
Class %	95.4%	0.8%	3.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
Group %	95.4%	4.3%			0.3%			0%			0%	0%

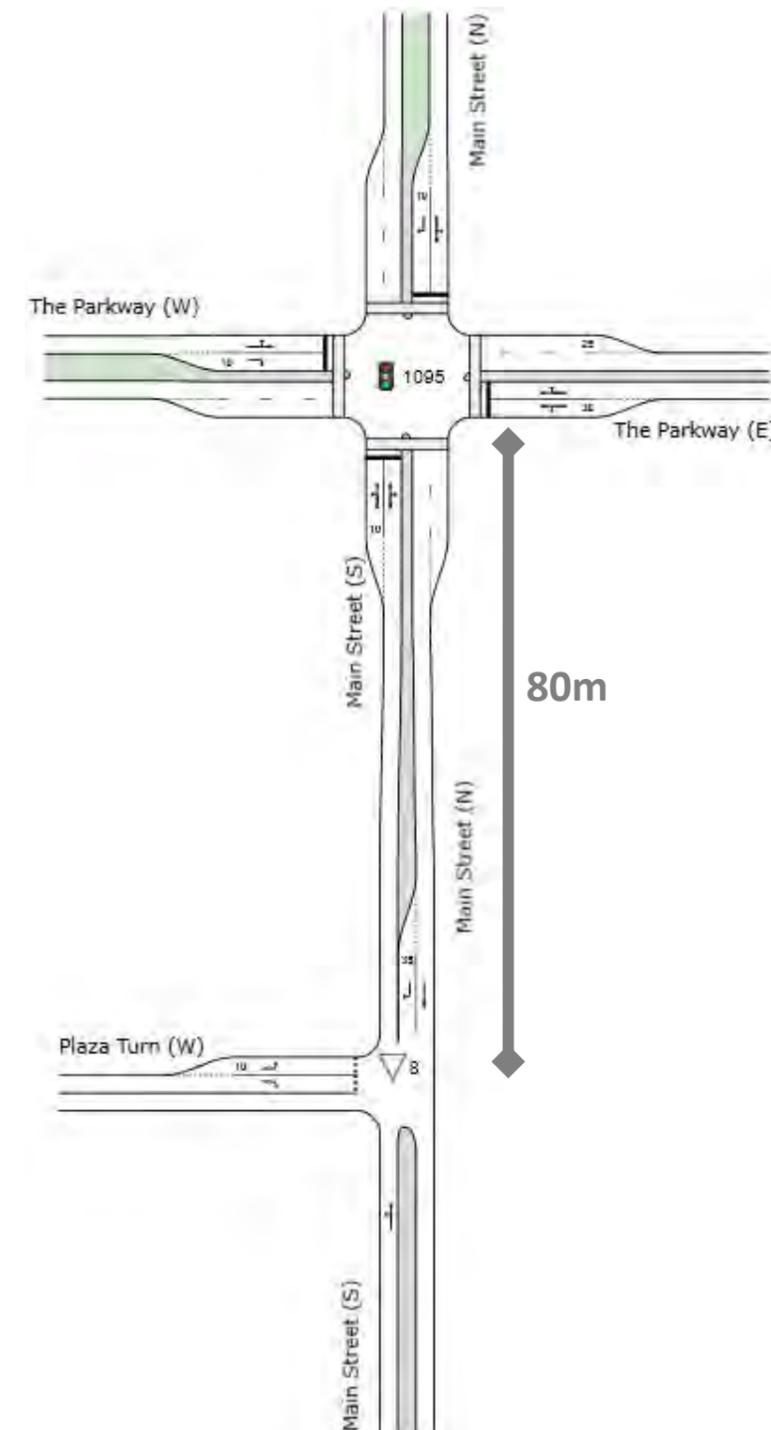


Figure 15: SIDRA intersection model layout

### 4.3 Key modelling findings

Based on the traffic generation and distribution exercise summarised in the section so far, static traffic modelling through the use of SIDRA Intersections (version 8.0) has been used to analyse the operational performance at the Main Street/ The Parkway and Main Street/ Plaza Turn intersections for opening year (2026), +5 years (2029) and +10 years (2034)

A detailed summary of the project case scenario results has been provided within **Appendix C** with the SIDRA movement summaries output provided within **Appendix D**.

#### 4.3.1 Baseline traffic performance

In order to evaluate the traffic impacts that the development will have on the surrounding network, an initial assessment of the baseline performance has been undertaken. For both the baseline and project-case model, the Ellenbrook Station precinct comprises of the Main Street/ The Parkway and Main Street/ Plaza Turn intersections. Modelling has been undertaken using traffic count surveys provided by METRONET and undertaken by Austraffic over a 24-hour period on the 3<sup>rd</sup> and 5<sup>th</sup> December 2019.

The existing performance of the intersection has been summarised below within Table 8.

Table 8: Baseline traffic performance

Intersection	Approach	Lane	LOS		Average Delay (s)		DoS		Queue Results (m)	
			AM	PM	AM	PM	AM	PM	AM	PM
Main Street/ The Parkway	North	Left	LOS B	LOS B	11.6	14.8	14.2%	17.9%	6.6	7.4
		Through	LOS A	LOS B	8	11.7	45.3%	47.5%	20.6	23.5
		Right	LOS B	LOS B	12.6	16.3	45.3%	47.5%	20.6	23.5
	East	Left	LOS B	LOS B	18.3	19.2	8.7%	9.9%	2.9	4.4
		Through	LOS B	LOS B	15.4	16.3	39.2%	35.1%	14.0	14.0
		Right	LOS C	LOS C	20.1	21	39.2%	35.1%	14.0	14.0
	South	Left	LOS B	LOS B	11.3	14	9.4%	1.1%	4.4	0.7
		Through	LOS A	LOS B	8.4	13.1	47.2%	45.4%	20.6	26.5
		Right	LOS B	LOS B	13.5	17.6	47.2%	45.4%	20.6	26.5
	West	Left	LOS B	LOS B	18.2	19	4.2%	7.4%	1.5	3.7
		Through	LOS B	LOS B	14.2	15.4	18.3%	29.9%	6.6	12.5
		Right	LOS B	LOS C	18.9	20.2	18.3%	29.9%	6.6	12.5
Overall	Intersection	LOS B	LOS B	13.5	17.6	47.2%	45.4%	20.6	26.5	
Main Street/ Plaza Turn	North	Through	LOS A	LOS A	0	0	9.8%	13.4%	0.0	0.0
		Right	LOS A	LOS A	5.7	5.4	11.9%	8.0%	1.5	0.7
	South	Left	LOS A	LOS A	4.6	4.6	16.7%	12.9%	0.0	0.0
		Through	LOS A	LOS A	0	0	16.7%	12.9%	0.0	0.0
	West	Left	LOS A	LOS A	5.3	5.1	11.9%	10.3%	2.2	1.5
		Right	LOS A	LOS A	8.4	8	11.9%	10.3%	2.2	1.5
	Overall	Intersection	NA	NA	8.4	8	16.7%	12.9%	2.2	1.5

As indicated, both intersections operate within capacity with appropriate Level of Service (LOS C or below) during both the AM and PM peak periods.

The right turn movement of the east approach at the Main Street/ The Parkway intersection shows increased vehicular delay with LOS C reported during both peaks.

At the Main Street/ Plaza Turn intersection, all movements were indicated to perform with LOS A within the baseline traffic performance assessment.

#### 4.3.2 2024 (opening year)

The network performs within capacity in terms of Level of Service and Degree of Saturation during the opening year of the station (2024) as shown below in Table 9.

Queueing from the south approach of the Main Street/ The Parkway intersection was shown to extend to the adjacent Main Street/ Plaza Turn

intersection.

The worst performing approaches are the east and west approaches at the Main Street/ The Parkway intersection, performing with a LOS D during the AM and PM peaks. However, the overall intersection performed with an average LOS B and a DoS below 75% during both peak periods.

The Main Street/ Plaza Turn intersection is expected to perform with good operation during both peak periods, reporting LOS A and a DoS below 50% during both peak periods.

95<sup>th</sup> percentile queueing at the right turn pocket of the north approach of the Main Street/ Plaza Turn intersection entering the station did not extend past the pocket lane (35 metres in storage) in either peak period, reporting 24.7 metre long queues in the AM peak.

Note that an overall intersection LOS was not reported for the Main Street/ Plaza Turn intersection as it is priority-controlled.

Table 9: Future modelling results – Ellenbrook Station road network (2024 opening year)

Intersection	Approach	LOS		Average Delay (s)		DoS		Queue Results (m)	
		AM	PM	AM	PM	AM	PM	AM	PM
Main Street/ The Parkway	North	LOS A	LOS B	9.8	10.1	71.0%	42.3%	118.7	74
	East	LOS D	LOS D	42.5	39.3	66.3%	59.8%	55.5	50.2
	South	LOS B	LOS B	11.4	11.6	67.4%	60.6%	95.5	93
	West	LOS D	LOS D	38.9	36.4	35.7%	50.1%	30.7	49.6
	Overall Intersection	LOS B	LOS B	16.2	18.6	71.0%	60.6%	118.7	93
Main Street/ Plaza Turn	North	LOS A	LOS A	7.7	5.6	49.9%	20.2%	24.7	6.2
	South	LOS A	LOS A	4.6	4.6	25.6%	15.7%	0	0
	West	LOS A	LOS A	6.9	5.7	35.6%	35.5%	10.9	11.3
	Overall Intersection	NA	NA	5.3	3.9	49.9%	35.5%	24.7	11.3

### 4.3.3 Opening +5 years (2029)

The Ellenbrook Station road network continues to operate within capacity at five-years post opening of the Ellenbrook Station as shown in Table 10.

Queueing from the south approach of the Main Street/ The Parkway intersection continues to extend to the adjacent Main Street/ Plaza Turn intersection.

The Main Street/ The Parkway intersection operates with an overall average intersection LOS B and a DoS below 75% during both the AM and PM peak periods.

The Main Street/ Plaza Turn intersection performs with good operation during both peak periods, reporting LOS A and a DoS below 60% during both peak periods.

95th percentile queueing at the right turn pocket of the north approach of the Main Street/ Plaza Turn intersection entering the station did not extend past the pocket lane (35 metres in storage) in either peak period, reporting 27.8 metre long queues in the AM peak.

Table 10: Future modelling results – Ellenbrook Station road network (2029)

Intersection	Approach	LOS		Average Delay (s)		DoS		Queue Results (m)	
		AM	PM	AM	PM	AM	PM	AM	PM
Main Street/ The Parkway	North	LOS A	LOS A	9.7	8.8	72.5%	42.5%	119	71.6
	East	LOS D	LOS D	44.3	42.5	71.2%	67.3%	57.1	53.3
	South	LOS B	LOS B	11.1	10.4	70.1%	71.0%	108.2	119.5
	West	LOS D	LOS D	40	38.6	38.1%	48.4%	31.2	42.3
	Overall Intersection	LOS B	LOS B	16.1	17.2	72.5%	71.0%	119	119.5
Main Street/ Plaza Turn	North	LOS A	LOS A	8.6	5.9	54.5%	21.5%	27.8	6.6
	South	LOS A	LOS A	4.6	4.6	32.9%	24.6%	0	0
	West	LOS A	LOS A	7.9	6.7	44.8%	54.8%	14.8	18.8
	Overall Intersection	NA	NA	5.6	4.2	54.5%	54.8%	27.8	18.8

### 4.3.4 Opening +10 years (2034)

The performance of the Main Street/ Plaza Turn intersection providing access to and from the station's main Park n Ride and Kiss n Ride facilities begins to be constrained by queues extending past the right turn pocket storage from the north approach.

The priority-controlled intersection continues to operate within capacity to at least 2034, reporting LOS B or better and a DoS below 80% during both peak periods.

Queueing from the south approach of the Main Street/ The Parkway intersection continues to increase to beyond 130 metres, causing additional delays for vehicles entering the station access.

However, the Main Street/ The Parkway intersection maintains good operation with a reported overall average intersection LOS B and a DoS below 85% during both peak periods, indicative of residual capacity at this intersection.

Table 10: Future modelling results – Ellenbrook Station road network (2034)

Intersection	Approach	LOS		Average Delay (s)		DoS		Queue Results (m)	
		AM	PM	AM	PM	AM	PM	AM	PM
Main Street/ The Parkway	North	LOS B	LOS A	12.8	8.4	84.8%	44.7%	124.6	75.2
	East	LOS D	LOS D	46.6	44.3	77.0%	72.2%	59.1	54.7
	South	LOS B	LOS B	12.7	10.1	78.4%	74.6%	138.7	137.2
	West	LOS D	LOS D	41.1	39.9	40.8%	50.2%	31.7	43
	Overall Intersection	LOS B	LOS B	18	16.8	84.8%	74.6%	138.7	137.2
Main Street/ Plaza Turn	North	LOS B	LOS A	11	6.5	65.5%	24.5%	35.6	7.3
	South	LOS A	LOS A	4.6	4.7	34.5%	41.2%	4.3	0
	West	LOS B	LOS B	12.8	10.6	75.8%	76.9%	29.5	33.5
	Overall Intersection	NA	NA	7.3	5.3	75.8%	76.9%	35.6	33.5

### 4.3.6 Summary of findings

The results of the future modelling have identified that the Main Street/ The Parkway intersection operates within practical capacity up to at least 2034 with a reported maximum average intersection LOS B during both peak periods.

Furthermore, the intersection at Main Street/ Plaza Turn is shown to operate within capacity up until the year 2034 (+10 opening year), with a reported movement LOS B or better and DOS below 80% during both peak periods.

Given the small separation of the two intersections, queuing issues have been identified at both intersections within all scenario assessed, including;

- Along south approach at the Main Street/ The Parkway intersection extending past the adjacent intersection of Main Street/ Plaza Turn
- Along the north approach right turn pocket at the Main Street/ Plaza Turn marginally extending past the 35-metre pocket length in 2034.

In order to mitigate these potential issues, the following strategies are recommended:

- The provision of a secondary access to the southern Park n Ride and Kiss n Ride facilities via Civic Terrace to the west of Main Street to allow a split in the demand and a reduction in the traffic through the Main Street/ Plaza Turn intersection. It should be noted this change has already been adopted into the design and the design drawings as a result of this modelling.
- Queuing on the southern approach impacting turning into and out of Plaza Turn should be monitored post-opening, and consideration of further treatments to mitigate any blocking of turning movements should be investigated – including provision of KEEP CLEAR pavement parking, in line with Main Roads Policy and Guidelines for KEEP CLEAR Pavement Marking.

## 5 Access strategy

### 5.1 Pedestrian and cyclist access

The pedestrian and cyclist catchment surrounding the Ellenbrook Station development is expected to be well serviced by connections both internal to the station precinct and the wider network. Active transport access to the station is enhanced by the introduction of a new PSP running to the south-west and connecting to the Drumpellier Drive shared path. This shared path provides connectivity for cyclists along the greater north-east growth corridor.

Cyclist access to the station will further benefit from the planned connections of the Ellenbrook Town Centre shared and on-street cycle paths to Northlink and to the existing shared path along the transit corridor reserve to the north. These have been outlined in *the City of Swan Cycle Network Plan* and should be prioritised for construction by the City in time for the commissioning of MEL.

Cyclists accessing the station will be able to utilise the 128 secure bicycle parking spots – this provision is in excess of 5% of the total daily boardings forecast for Ellenbrook station in 2051.

Connections to the existing footpath network have been included in the Ellenbrook Station design – it is anticipated that walking will be one of the primary access modes to the station, especially with the contemplated mixed-use development surrounding the site.

Figure 16 shows the key active transport connections surrounding the site.

### 5.2 Public transport access

In order to provide high quality bus feeder services to and from Ellenbrook Station, several new or modified bus services have been included as part of the MEL project. These feeder services provide direct public transport connection to the greater Ellenbrook suburb, as well as the surrounding suburbs of Avey and The Vines.

Bus services to and from the planned Whiteman Park station are also to be provided, providing access to the station for users south of the Ellenbrook Town Centre.

Bus access has been prioritised in the precinct design, with the bus interchange located directly adjacent to the station building. The furthest bus stand approximately 220 metres from the entrance building, and shelters provided for the entire walk. This, combined with the low peak hour headways (10 minutes) will result in a significant improvement in public transport service Ellenbrook and the immediate surrounds.

The planned bus routes and stops surrounding Ellenbrook Station can be seen in Figure 17.

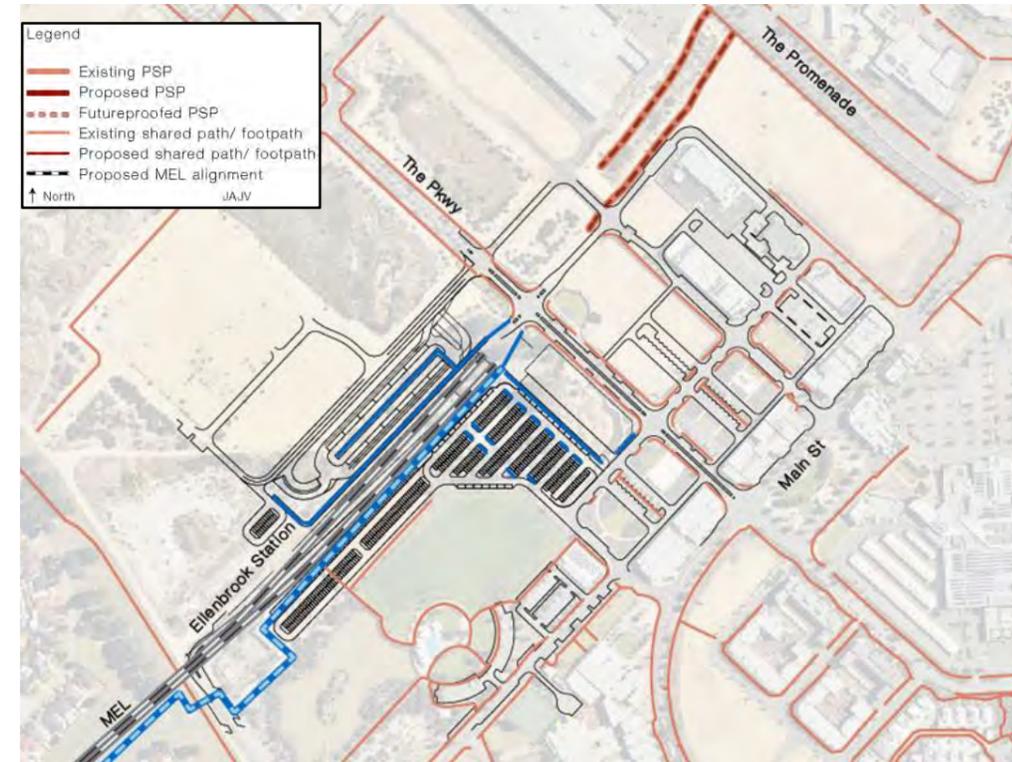


Figure 16: Pedestrian and cycling connections surrounding the development

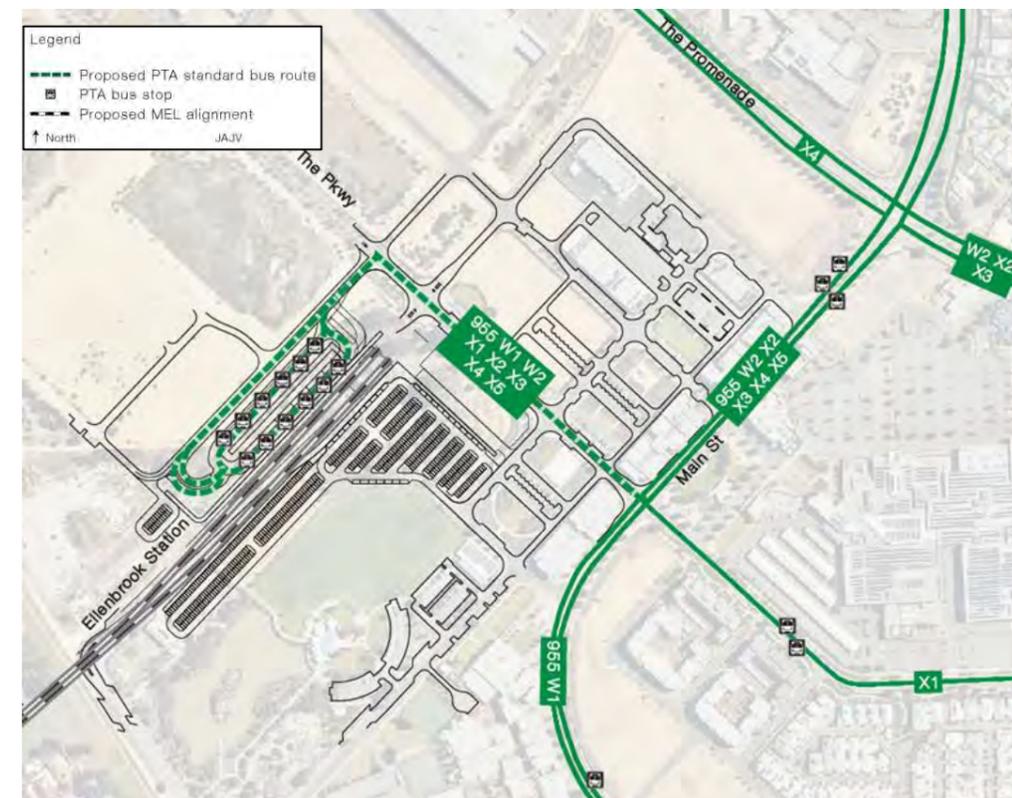


Figure 17: Public transport provisions surrounding the development

### 5.3 Vehicular access

Based on the proposed access arrangement and modification of existing roads as described in Section 3.1, Figure 19 illustrates the proposed inbound and outbound routes from various origin and destination points surrounding the station precinct.

As shown, primary access to the station PnR (PnR 1) and KnR facilities will be facilitated by either Plaza Turn or Civic Terrace, depending on the origin point of the user. Secondary access to the smaller PnR facility (PnR 2) will be from The Parkway and Cussington Way, with some future users expected to access from the future Cussington Way extension when this is constructed. In line with the location of the facilities, it is expected that users to the immediately north-west of the station will favour use of the smaller PnR2, with most other users utilising the larger PnR1

Egress routes from the station are expected to mirror the access routes. It is anticipated that some users headed southbound on Main Street from the precinct may utilise a right turn from The Parkway rather than Plaza Turn depending on prevailing traffic conditions.

It should be noted that service and emergency vehicles will generally utilise the PnR1/KnR access routes – with the exception of fire trucks which will access through the bus interchange at the same location as outlined in Figure 14.

#### 5.3.1 Swept path analysis

Swept path analysis has been conducted for access to and movements within the station precinct. An excerpt of the swept path analysis diagram can be seen in Figure 20, with the full drawing (25-A-291-CI-0135) attached in Appendix E. Swept path analysis has been undertaken using the following design vehicles:

- B99 Passenger Vehicle (5.2m) (green)

*Used for general traffic movements within the PnR/KnR.*

- Single Unit Truck/Bus (12.5m) (light blue)

*Used to check the 'worst case' access to the standard bus bay*

- Articulated bus (19.0m) (blue)

*Used to check all other bus movements*

- Service vehicle (8.8m) (red)

*Used to check refuse/service vehicle movements*

- Pumper fire truck (12.192m) (magenta)

*Used to check access to DFES hardstand area*

All of these design vehicles are Austroads standard templates, with the exception of the pumper fire truck which was selected as a conservative representation of a DFES fire truck.

#### 5.3.2 Parking and parking management

As outlined in Table 2 (section 3.2.3), general 445 all-day parking bays have been provided for users across the two PnR facilities. This is accompanied by 28 short term parking/PUDO bays across PnR1 and the KnR. In addition to this provision, specific parking bays are allocated for ACROD, EV charging, tenant (kiosk) parking, staff parking and taxis. ACROD parking has been provided at a rate of 1 in 50 (2%). Motorcycle parking has been provided in addition to this, with 10 sheltered bays provided in PnR1, in close proximity to the station building.

Although significant parking facilities have been provided, it is anticipated that without sufficient parking management controls, station users may attempt to use on-street parking in the Ellenbrook Town Centre – either to avoid paying fees or due to the convenience of parking on adjacent roads (specifically The Parkway). This parking is currently not time or use limited and has no parking fee. Likewise, visitors to the Ellenbrook Town Centre may utilise the PnR facilities as free/cheap parking.

In order to prevent undesired use of the station parking or surrounding on-street parking the following is recommended:

- The City may wish to impose a time or use limit, or charge fees for on-street parking to prevent commuters from using these bays
- The PTA is expected to enforce the use of the PnR facility by requiring users to display a ticket or register their license plate, which will be linked to a SmartRider pass.

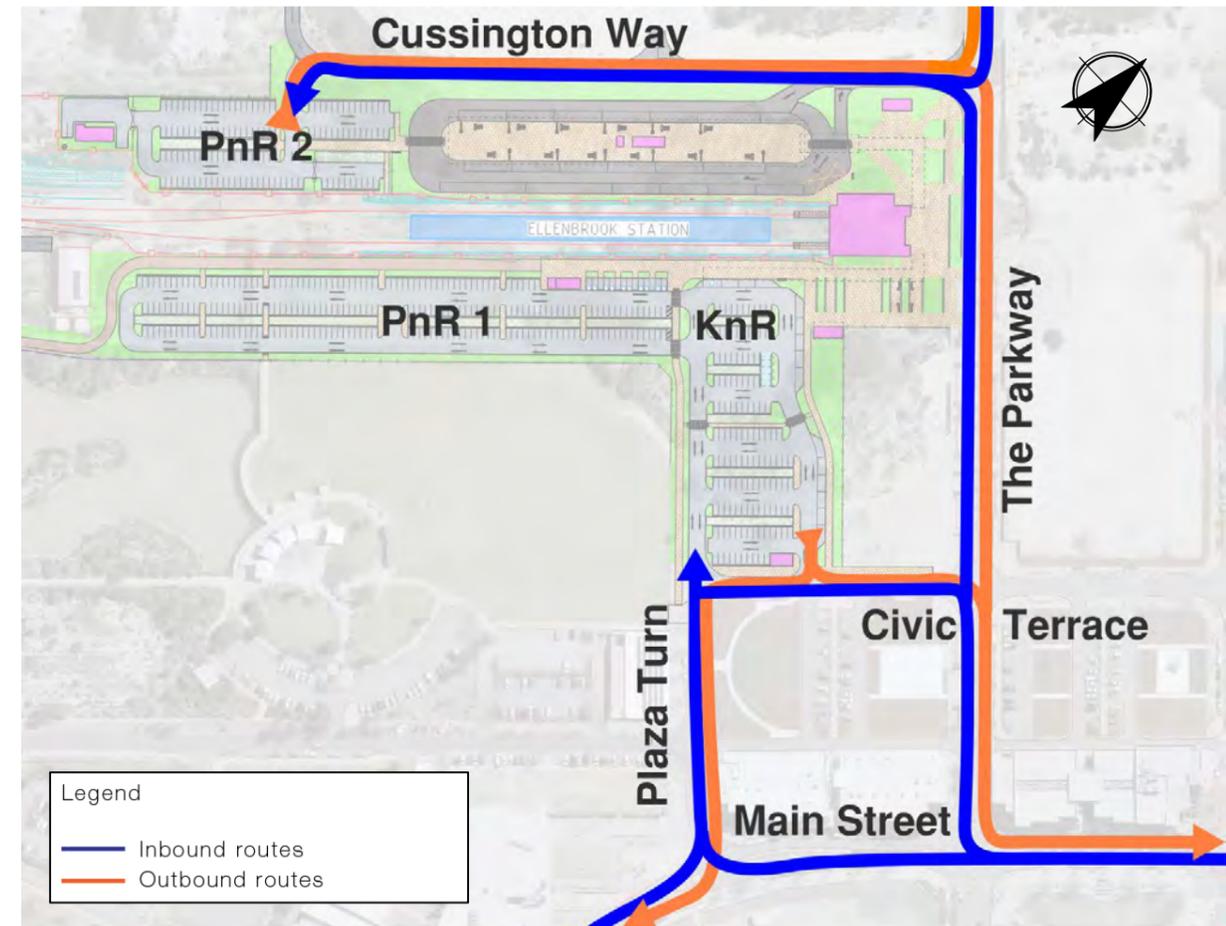


Figure 19: Inbound and outbound routes for the PnR and KnR facilities

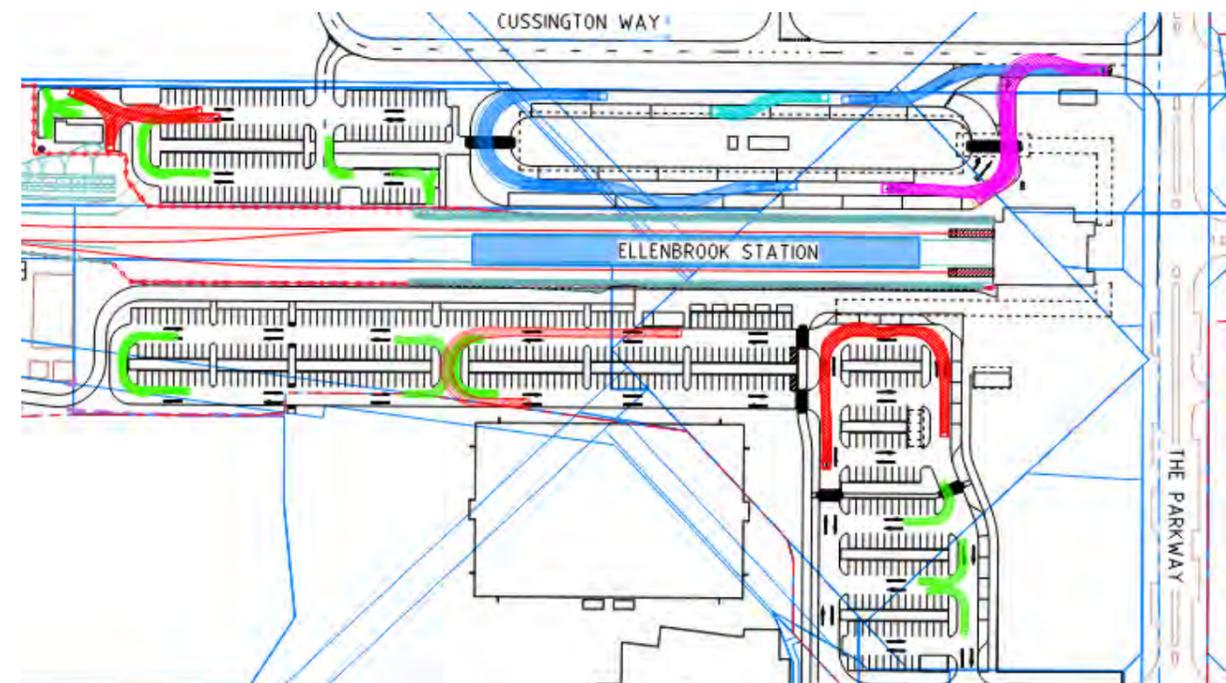


Figure 20: Ellenbrook Station swept path analysis

## 6 Recommendations and summary

The Ellenbrook Station and surrounding precinct is currently being planned as part of the overall delivery of the MEL passenger rail service proposed to operate between Ellenbrook and the Perth CBD, with an expected opening year of 2024. This TIA has detailed the associated impacts that the development will have on the surrounding transport network and the expected land uses within and surrounding the vicinity of the site.

The proposed site is planned to comprise a new at-grade rail station accompanied by a 500-bay PnR facility and KnR, a 12-stand bus interchange and 128 bay secure cycling facility for station users. Access to the station will be facilitated through a combination of existing roads (Plaza Turn, Civic Terrace, The Parkway), and a new section of Cussington Way. PnR facilities are split over the station precinct to provide more proximate access to those residing north-west of the station.

The surrounding land-use has been planned with the construction of Ellenbrook Station in mind – this is highlighted in the *Ellenbrook Town Centre Development Plan*, which contemplates leveraging the opportunity provided by a high quality transit node to support infill and activity in the Ellenbrook Town Centre. The Station is expected to become a major enabler of development and commercial activity in the area.

The station is estimated to generate a total of 580 inbound and 285 outbound private vehicle trips during the AM peak hour; with 136 inbound and 323 outbound trips in the PM peak hour – although this means it is a reasonable trip generator, the provision of alternate transport modes and the existing capacity on the Ellenbrook road network mean that the traffic network is able to operate within capacity. All movements for the surrounding intersections operate with a Level of Service of D or greater, and a Degree of Saturation of less than 85% at 10 years post-opening.

Based on the operational analysis and assessment of the access and supporting network, the following recommendations have been developed:

### Pedestrian and cyclist access:

- Construction of the cycle infrastructure proposed for the Ellenbrook Town Centre in the *City of Swan Cycle Network Plan* should be prioritised by the City in order to leverage and enhance active transport connectivity to and through the station precinct.

### Public transport access:

- The proposed routes outlined in this TIA are yet to be finalised, and are still being refined by the PTA. It is not anticipated that the final frequencies of these bus routes will change significantly enough to affect the findings of the TIA.
- Amendment of the existing routes to provide convenient and efficient connection to the proposed station will be required to achieve the bus access mode split desired for the station.

### Vehicle access:

- The provision of a secondary access to the southern Park n Ride and Kiss n Ride facilities via Civic Terrace to the west of Main Street to allow a split in the demand and a reduction in the traffic through the Main Street/ Plaza Turn intersection. It should be noted this change has already been adopted into the design and the design drawings as a result of this modelling
- Queuing on the southern approach impacting turning into and out of Plaza Turn should be monitored post-opening, and consideration of further treatments to mitigate any blocking of turning movements should be investigated – including provision of KEEP CLEAR pavement parking, in line with *Main Roads Policy and Guidelines for KEEP CLEAR Pavement Marking*.

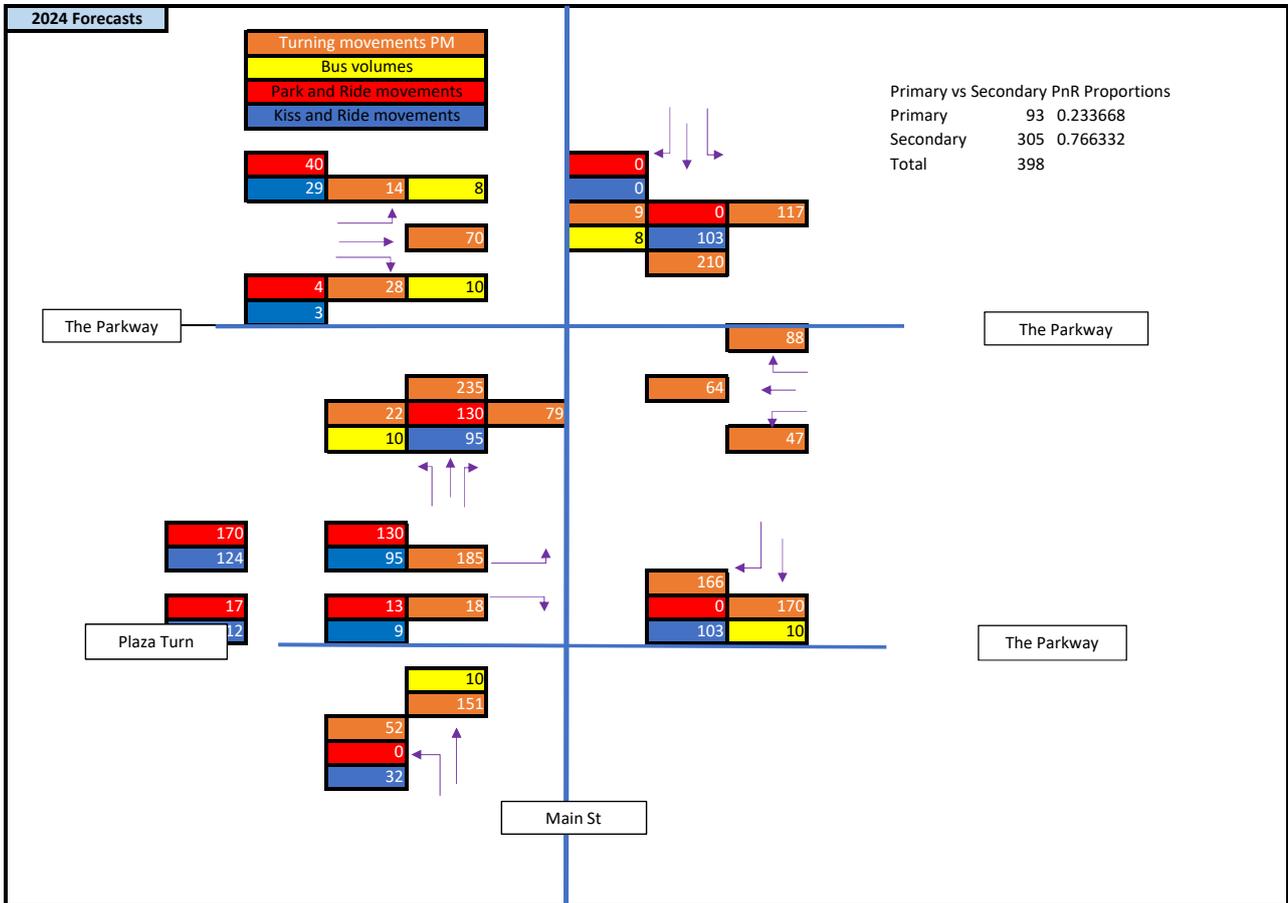
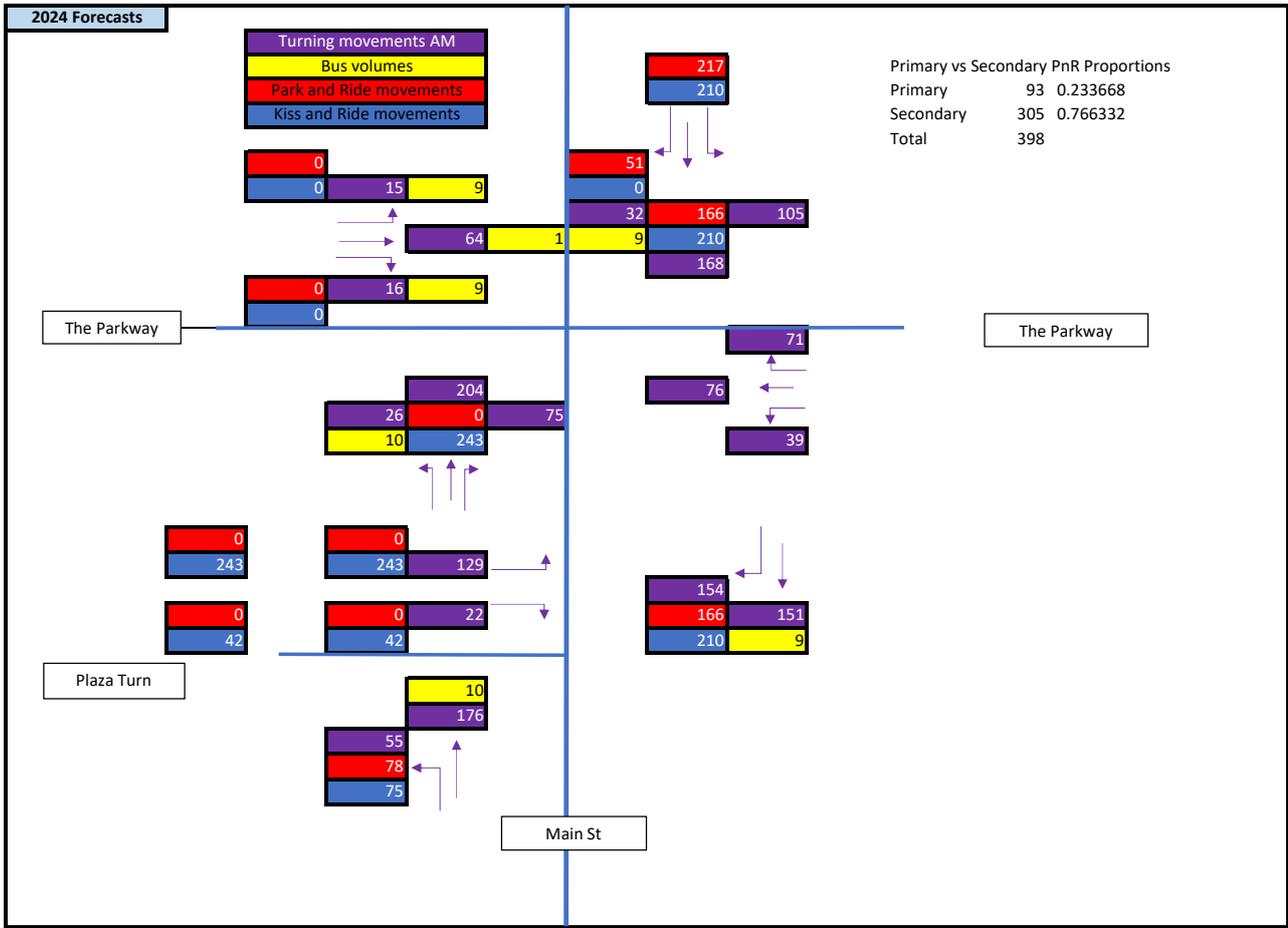
### Parking management:

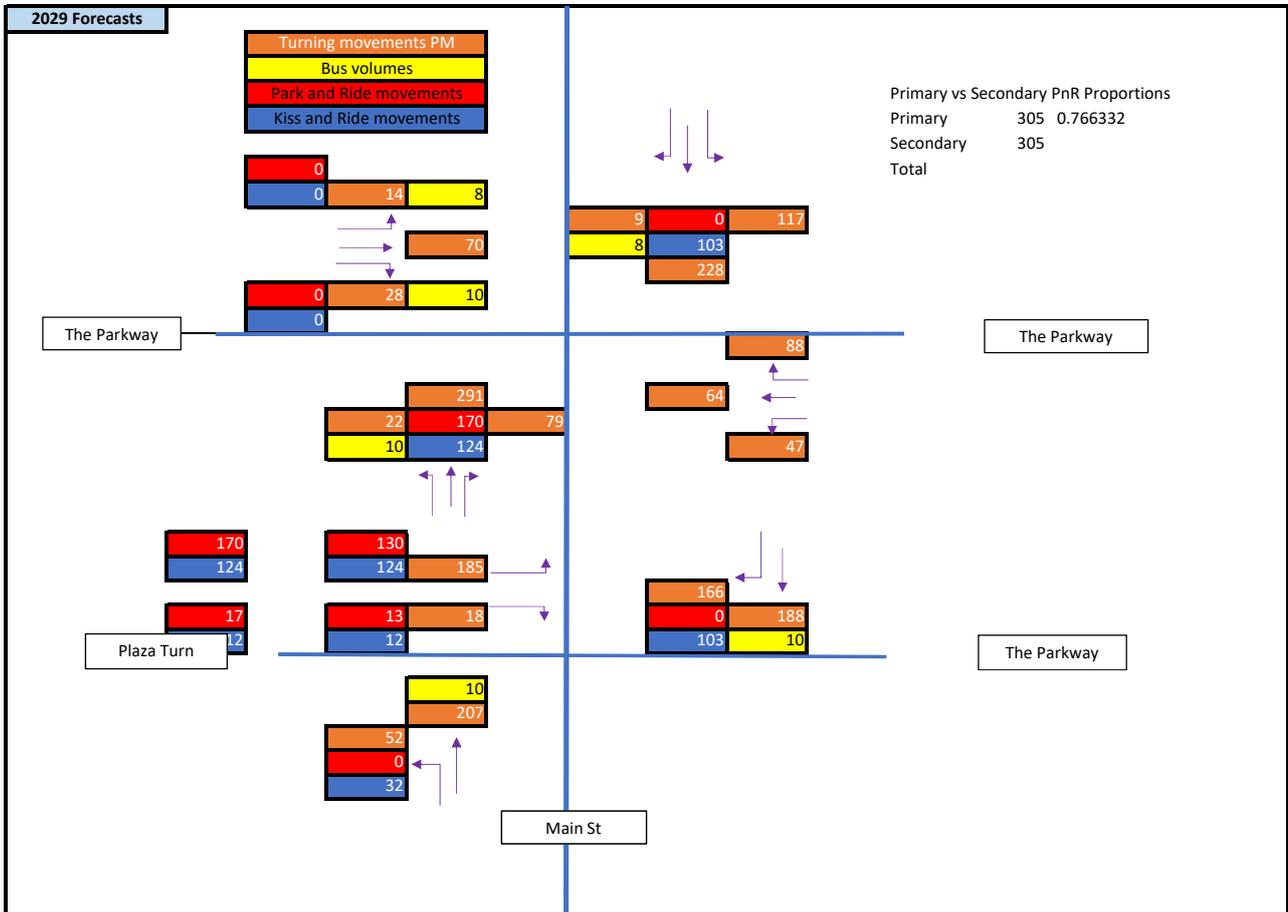
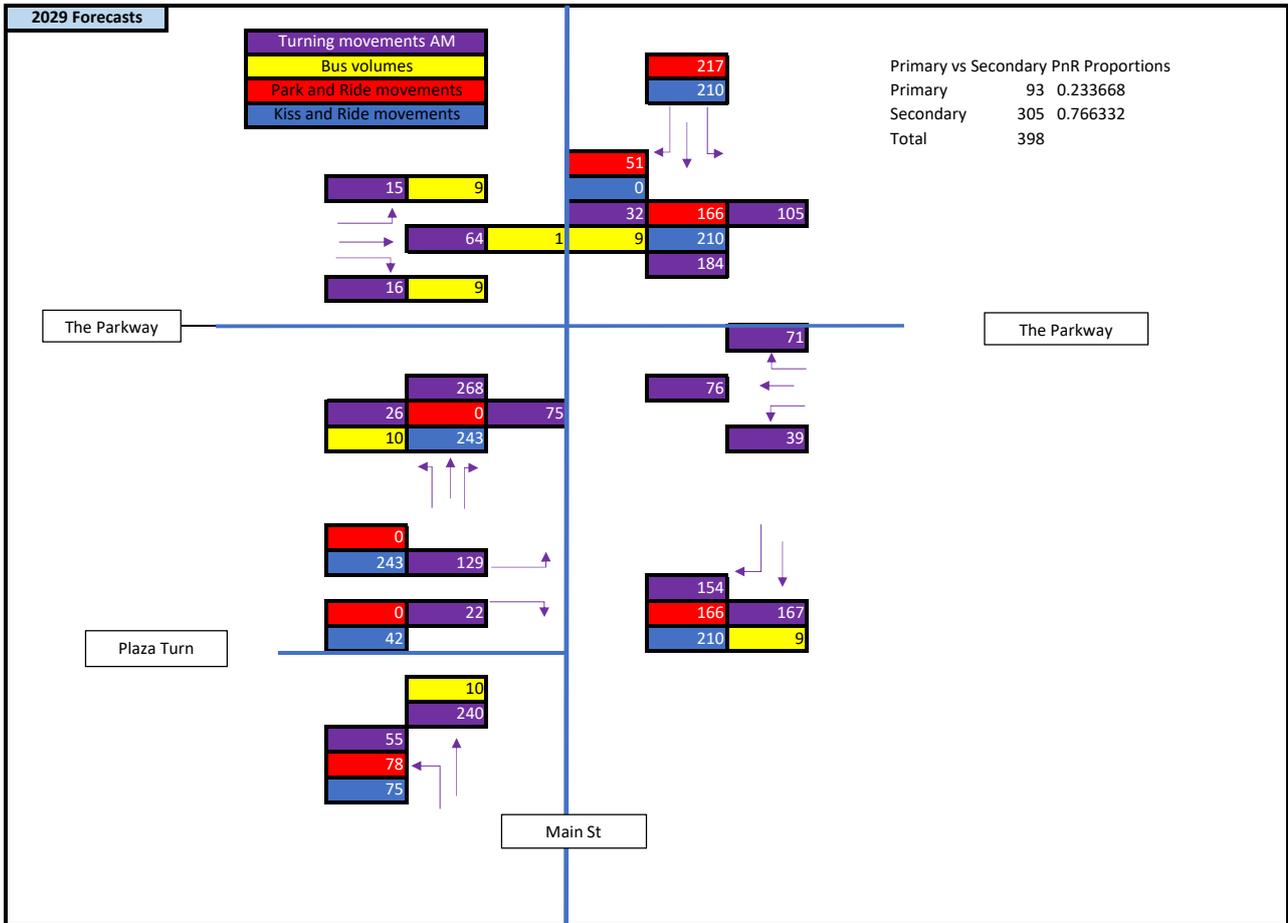
- The City should look to impose a time or use limit, or charge fees for on-street parking to prevent commuters from using these bays.
- The PTA is expected to enforce the use of the PnR facility by requiring users to display a ticket or register their license plate, which will be linked to a SmartRider pass.

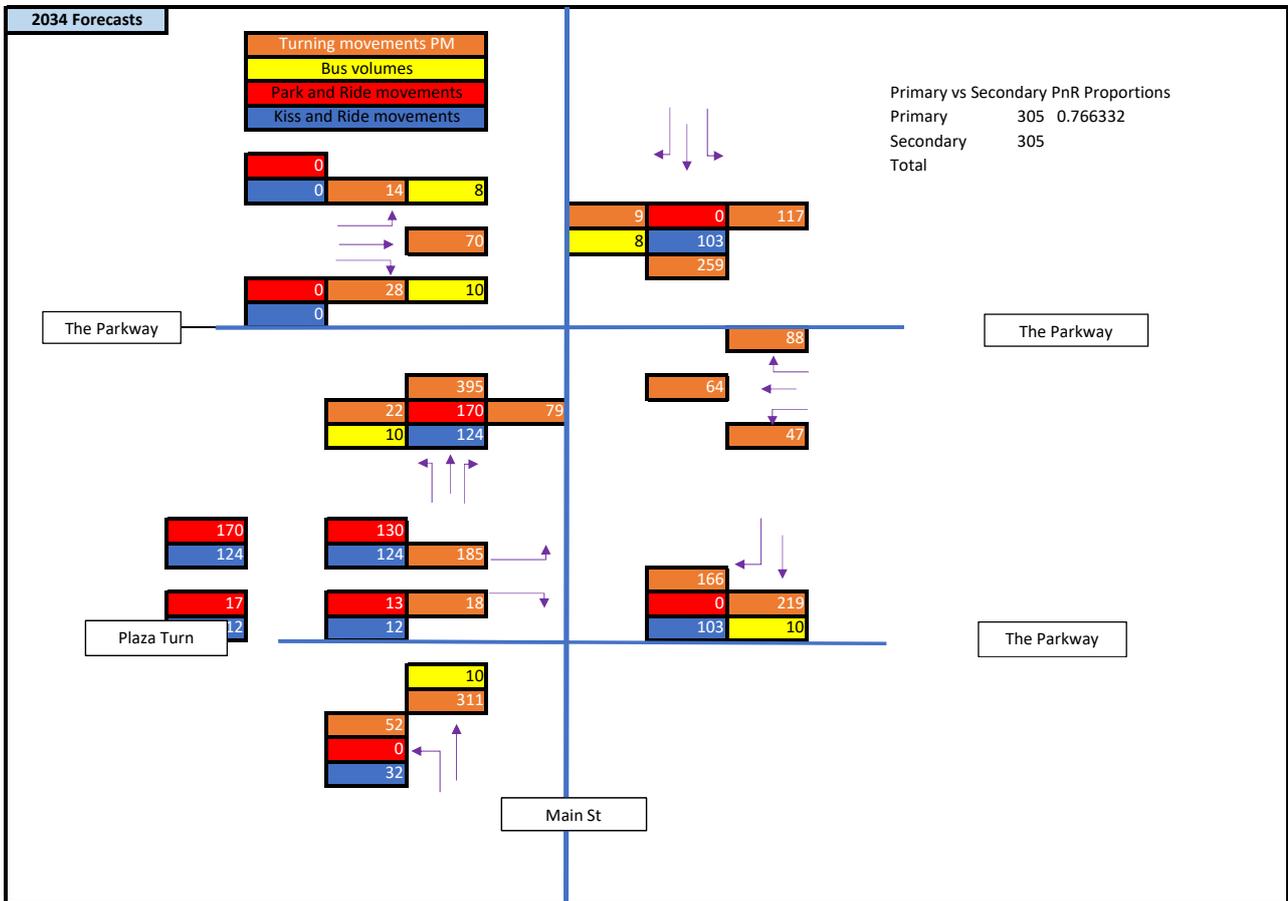
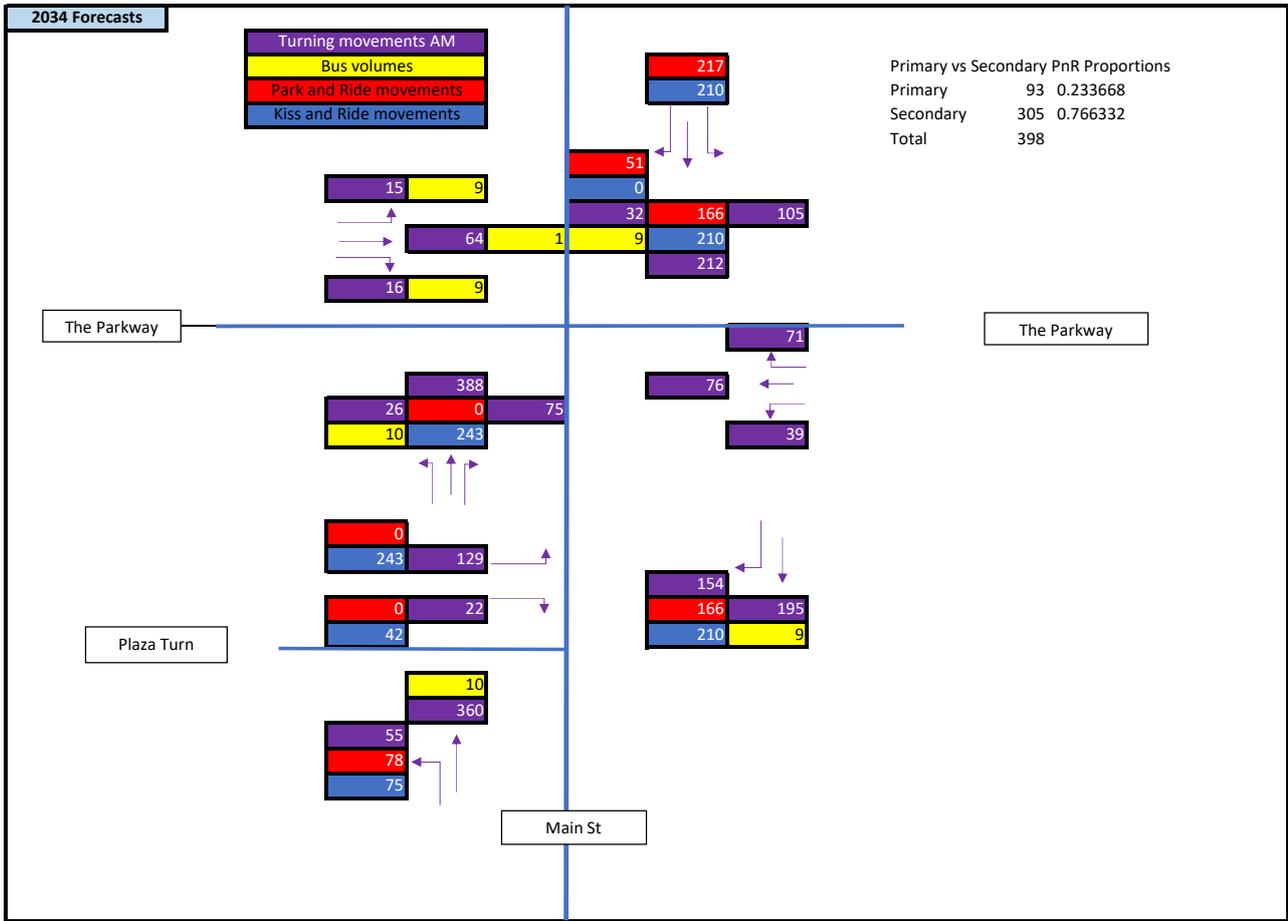
## Appendix A – Ellenbrook Station precinct traffic forecasts



## Appendix B – Future peak period turning movement volumes







## Appendix C – Project case scenario results

2024 Results

Intersection	Approach	Lane	LOS		Average Delay (s)		Degree of Saturation		Queue Results (pcu's)	
			AM	PM	AM	PM	AM	PM	AM	PM
Main St / The Parkway	North	Left	LOS B	LOS B	12.1	13.1	71.0%	42.3%	118.7	74
		Through	LOS A	LOS A	7.5	8.6	71.0%	42.3%	118.7	74
		Right	LOS C	LOS B	20.5	19.1	55.9%	5.8%	21.4	4.4
	East	Left	LOS D	LOS C	38.7	34.1	13.3%	12.0%	12.1	13.3
		Through	LOS D	LOS D	41.2	38.1	66.3%	59.8%	55.5	50.2
		Right	LOS D	LOS D	46	43	66.3%	59.8%	55.5	50.2
	South	Left	LOS B	LOS B	10	11.9	13.5%	12.1%	17.3	17.9
		Through	LOS B	LOS B	10.6	10.7	67.4%	60.6%	95.5	93
		Right	LOS B	LOS B	16.8	16.2	67.4%	60.6%	95.5	93
	West	Left	LOS D	LOS D	40.9	36.7	35.7%	50.1%	30.7	49.6
		Through	LOS D	LOS C	35.7	32	35.7%	50.1%	30.7	49.6
		Right	LOS D	LOS D	45.3	42.4	16.4%	22.9%	10.4	16.4
Main St / Plaza Turn	North	Through	LOS A	LOS A	0.1	0.1	9.8%	10.8%	0	0
		Right	LOS A	LOS A	7.7	5.6	49.9%	20.2%	24.7	6.2
	South	Left	LOS A	LOS A	4.6	4.6	25.6%	15.7%	0	0
		Through	LOS A	LOS A	0	0.1	25.6%	15.7%	0	0
	West	Left	LOS A	LOS A	5.5	5.3	35.6%	35.5%	10.9	11.3
		Right	LOS C	LOS A	15.2	9.3	20.6%	7.6%	5.7	2.1

2029 Results

Intersection	Approach	Lane	LOS		Average Delay (s)		Degree of Saturation		Queue Results (pcu's)	
			AM	PM	AM	PM	AM	PM	AM	PM
Main St / The Parkway	North	Left	LOS B	LOS B	11.7	11.8	72.5%	42.5%	119	71.6
		Through	LOS A	LOS A	7.1	7.2	72.5%	42.5%	119	71.6
		Right	LOS C	LOS B	23.4	19.3	63.3%	6.8%	23.5	4.5
	East	Left	LOS D	LOS D	39.7	36.9	14.2%	13.5%	12.4	13.5
		Through	LOS D	LOS D	43.2	41.5	71.2%	67.3%	57.1	53.3
		Right	LOS D	LOS D	48	46.2	71.2%	67.3%	57.1	53.3
	South	Left	LOS A	LOS B	9.7	10.7	14.0%	14.2%	18.9	15.9
		Through	LOS B	LOS A	10.4	9.7	70.1%	71.0%	108.2	119.5
		Right	LOS B	LOS B	16.6	15	70.1%	71.0%	108.2	119.5
	West	Left	LOS D	LOS D	42	39.2	38.1%	48.4%	31.2	42.3
		Through	LOS D	LOS C	36.8	34.4	38.1%	48.4%	31.2	42.3
		Right	LOS D	LOS D	46.5	44.8	17.7%	25.0%	10.6	16.3
Main St / Plaza Turn	North	Through	LOS A	LOS A	0	0	10.7%	12.0%	0	0
		Right	LOS A	LOS A	8.6	5.9	54.5%	21.5%	27.8	6.6
	South	Left	LOS A	LOS A	4.6	4.6	32.9%	24.6%	0	0
		Through	LOS A	LOS A	0.1	0.1	32.9%	24.6%	0	0
	West	Left	LOS A	LOS A	6.3	6.4	44.8%	54.8%	14.8	18.8
		Right	LOS C	LOS A	17.4	9.9	23.4%	8.7%	6.5	2.4

2034 Results

Intersection	Approach	Lane	LOS		Average Delay (s)		Degree of Saturation		Queue Results (pcu's)	
			AM	PM	AM	PM	AM	PM	AM	PM
Main St / The Parkway	North	Left	LOS B	LOS B	11.8	11.4	76.8%	44.7%	124.6	75.2
		Through	LOS A	LOS A	7.1	6.8	76.8%	44.7%	124.6	75.2
		Right	LOS D	LOS C	50.3	20.7	84.8%	8.2%	36.7	4.8
	East	Left	LOS D	LOS D	40.8	37.9	15.4%	14.4%	12.8	13.9
		Through	LOS D	LOS D	45.8	43.5	77.0%	72.2%	59.1	54.7
		Right	LOS D	LOS D	50.7	48.3	77.0%	72.2%	59.1	54.7
	South	Left	LOS A	LOS B	9.4	10.5	15.7%	14.9%	20.3	20.3
		Through	LOS B	LOS A	12.2	9.5	78.4%	74.6%	138.7	137.2
		Right	LOS B	LOS B	18.7	15	78.4%	74.6%	138.7	137.2
	West	Left	LOS D	LOS D	43.1	40.3	40.8%	50.2%	31.7	43
		Through	LOS D	LOS D	37.9	35.5	40.8%	50.2%	31.7	43
		Right	LOS D	LOS D	47.7	46.7	19.2%	26.6%	10.8	16.4
Main St / Plaza Turn	North	Through	LOS A	LOS A	1.4	0	21.8%	13.6%	6.3	0
		Right	LOS B	LOS A	11	6.5	65.5%	24.5%	35.6	7.3
	South	Left	LOS A	LOS A	4.6	4.7	34.5%	41.2%	4.3	0
		Through	LOS A	LOS A	0	0.1	34.5%	41.2%	4.3	0
	West	Left	LOS B	LOS B	11.1	10.5	75.8%	76.9%	29.5	33.5
		Right	LOS C	LOS B	22.7	11.9	30.0%	10.7%	8.3	2.9

## Appendix D – SIDRA movement summaries

Main Street / The Parkway Intersection - AM Peak

2024

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	39	29.8	39	29.8	0.135	10	LOS B	2.1	17.3	0.36	0.39	0.36	43.6	
2	T1	489	4.3	489	4.3	0.674	10.6	LOS B	12.5	95.5	0.59	0.57	0.59	27	
3	R2	82	1.3	82	1.3	0.674	16.8	LOS B	12.5	95.5	0.66	0.62	0.66	37.9	
Approach		610	5.6	610	5.6	0.674	11.4	LOS B	12.5	95.5	0.59	0.56	0.59	31.4	
East: The Parkway (E)															
4	L2	43	0	43	0	0.133	38.7	LOS D	1.6	12.1	0.88	0.72	0.88	24.5	
5	T1	83	1.3	83	1.3	0.663	41.2	LOS D	7.1	55.5	0.99	0.85	1.06	31.4	
6	R2	78	11.3	78	11.3	0.663	46	LOS D	7.1	55.5	0.99	0.85	1.07	24.6	
Approach		204	4.8	204	4.8	0.663	42.5	LOS D	7.1	55.5	0.97	0.83	1.02	27.9	
North: Main Street (N)															
7	L2	115	7	115	7	0.71	12.1	LOS B	15.5	118.7	0.54	0.53	0.54	41.2	
8	T1	596	3.1	596	3.1	0.71	7.5	LOS A	15.5	118.7	0.54	0.53	0.54	23.5	
9	R2	100	9.4	100	9.4	0.559	20.5	LOS C	2.7	21.4	0.63	0.72	0.65	33.8	
Approach		811	4.4	811	4.4	0.71	9.8	LOS A	15.5	118.7	0.55	0.56	0.56	31.5	
West: The Parkway (W)															
10	L2	26	40.8	26	40.8	0.357	40.9	LOS D	3.8	30.7	0.91	0.73	0.91	26.7	
11	T1	71	1.5	71	1.5	0.357	35.7	LOS D	3.8	30.7	0.91	0.73	0.91	33.5	
12	R2	27	35.1	27	35.1	0.164	45.3	LOS D	1.1	10.4	0.93	0.72	0.93	23.3	
Approach		124	17	124	17	0.357	38.9	LOS D	3.8	30.7	0.92	0.73	0.92	30.5	
All Vehicles		1749	5.8	1749	5.8	0.71	16.2	LOS B	15.5	118.7	0.64	0.6	0.65	30.3	

Main St\_Plaza Turn Intersection - AM Peak

2024

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	228	0	228	0	0.256	4.6	LOS A	0	0	0	0.29	0	47.8	
2	T1	203	10.2	203	10.2	0.256	0	LOS A	0	0	0	0.29	0	46.4	
Approach		431	4.8	431	4.8	0.256	2.5	NA	0	0	0	0.29	0	47.4	
North: Main Street (N)															
8	T1	175	10	175	10	0.098	0.1	LOS A	0	0	0	0.01	0	51.6	
9	R2	580	0	580	0	0.499	7.7	LOS A	3.4	24.7	0.52	0.8	0.7	41.5	
Approach		755	2.3	755	2.3	0.499	5.9	NA	3.4	24.7	0.4	0.62	0.54	43.3	
West: Plaza Turn (W)															
10	L2	407	0.6	407	0.6	0.356	5.5	LOS A	1.5	10.9	0.36	0.58	0.36	43	
12	R2	70	0	70	0	0.206	15.2	LOS C	0.8	5.7	0.76	0.91	0.79	40.1	
Approach		477	0.5	477	0.5	0.356	6.9	LOS A	1.5	10.9	0.42	0.63	0.43	42.3	
All Vehicles		1662	2.4	1662	2.4	0.499	5.3	NA	3.4	24.7	0.3	0.54	0.37	44.1	

Main Street / The Parkway Intersection - PM Peak

2024

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	34	31.2	34	31.2	0.121	11.9	LOS B	2.2	17.9	0.42	0.43	0.42	42.3	
2	T1	487	4	487	4	0.606	10.7	LOS B	12.2	93	0.59	0.56	0.59	26.9	
3	R2	83	1.5	83	1.5	0.606	16.2	LOS B	12.2	93	0.63	0.6	0.63	38.2	
Approach		604	5.2	604	5.2	0.606	11.6	LOS B	12.2	93	0.59	0.56	0.59	31.2	
East: The Parkway (E)															
4	L2	50	0	50	0	0.12	34.1	LOS C	1.8	13.3	0.82	0.72	0.82	26.1	
5	T1	68	0	68	0	0.598	38.1	LOS D	6.7	50.2	0.96	0.81	0.97	32.1	
6	R2	93	3.3	93	3.3	0.598	43	LOS D	6.7	50.2	0.97	0.81	0.98	25.4	
Approach		210	1.4	210	1.4	0.598	39.3	LOS D	6.7	50.2	0.93	0.79	0.94	28.2	
North: Main Street (N)															
7	L2	124	2	124	2	0.423	13.1	LOS B	9.6	74	0.52	0.53	0.52	40.1	
8	T1	332	5.3	332	5.3	0.423	8.6	LOS A	9.6	74	0.52	0.53	0.52	21.3	
9	R2	18	50.1	18	50.1	0.058	19.1	LOS B	0.4	4.4	0.56	0.66	0.56	35.7	
Approach		473	6.2	473	6.2	0.423	10.1	LOS B	9.6	74	0.52	0.54	0.52	31.8	
West: The Parkway (W)															
10	L2	96	8.8	96	8.8	0.501	36.7	LOS D	6.4	49.6	0.89	0.76	0.89	27.6	
11	T1	74	1.5	74	1.5	0.501	32	LOS C	6.4	49.6	0.89	0.76	0.89	34.1	
12	R2	47	22.2	47	22.2	0.229	42.4	LOS D	1.9	16.4	0.91	0.74	0.91	23.9	
Approach		217	9.2	217	9.2	0.501	36.4	LOS D	6.4	49.6	0.9	0.76	0.9	29.5	
All Vehicles		1505	5.6	1505	5.6	0.606	18.6	LOS B	12.2	93	0.66	0.61	0.66	30.1	

Main St\_Plaza Turn Intersection - PM Peak

2024

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	89	0	89	0	0.157	4.6	LOS A	0	0	0	0.19	0	48.6	
2	T1	170	11.1	170	11.1	0.157	0.1	LOS A	0	0	0	0.19	0	47.7	
Approach		259	7.3	259	7.3	0.157	1.6	NA	0	0	0	0.19	0	48.2	
North: Main Street (N)															
8	T1	190	11.3	190	11.3	0.108	0.1	LOS A	0	0	0	0.01	0	51.6	
9	R2	284	0	284	0	0.202	5.6	LOS A	0.8	6.2	0.33	0.58	0.33	43.1	
Approach		474	4.5	474	4.5	0.202	3.4	NA	0.8	6.2	0.2	0.35	0.2	45.9	
West: Plaza Turn (W)															
10	L2	433	0	433	0	0.355	5.3	LOS A	1.5	11.3	0.33	0.56	0.33	43.1	
12	R2	42	0	42	0	0.076	9.3	LOS A	0.3	2.1	0.58	0.77	0.58	43.1	
Approach		475	0	475	0	0.355	5.7	LOS A	1.5	11.3	0.35	0.58	0.35	43.1	
All Vehicles		1208	3.3	1208	3.3	0.355	3.9	NA	1.5	11.3	0.22	0.41	0.22	45.3	

Main Street / The Parkway Intersection - AM Peak

2029

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
<b>South: Main Street (S)</b>															
1	L2	39	29.8	39	29.8	0.14	9.7	LOS A	2.4	18.9	0.35	0.38	0.35	43.9	
2	T1	560	4.3	560	4.3	0.701	10.4	LOS B	14.1	108.2	0.6	0.57	0.6	27.3	
3	R2	82	1.3	82	1.3	0.701	16.6	LOS B	14.1	108.2	0.67	0.63	0.67	38	
Approach		681	5.4	681	5.4	0.701	11.1	LOS B	14.1	108.2	0.59	0.57	0.59	31.3	
<b>East: The Parkway (E)</b>															
4	L2	43	0	43	0	0.142	39.7	LOS D	1.7	12.4	0.89	0.72	0.89	24.2	
5	T1	83	1.3	83	1.3	0.712	43.2	LOS D	7.3	57.1	1	0.89	1.13	30.9	
6	R2	78	11.3	78	11.3	0.712	48	LOS D	7.3	57.1	1	0.89	1.13	24	
Approach		204	4.8	204	4.8	0.712	44.3	LOS D	7.3	57.1	0.98	0.85	1.08	27.4	
<b>North: Main Street (N)</b>															
7	L2	115	7	115	7	0.725	11.7	LOS B	15.6	119	0.53	0.52	0.53	41.5	
8	T1	614	3.1	614	3.1	0.725	7.1	LOS A	15.6	119	0.53	0.52	0.53	24.2	
9	R2	100	9.4	100	9.4	0.633	23.4	LOS C	3	23.5	0.63	0.77	0.76	32.4	
Approach		829	4.4	829	4.4	0.725	9.7	LOS A	15.6	119	0.55	0.55	0.56	31.4	
<b>West: The Parkway (W)</b>															
10	L2	26	40.8	26	40.8	0.381	42	LOS D	3.9	31.2	0.92	0.74	0.92	26.3	
11	T1	71	1.5	71	1.5	0.381	36.8	LOS D	3.9	31.2	0.92	0.74	0.92	33.2	
12	R2	27	35.1	27	35.1	0.177	46.5	LOS D	1.1	10.6	0.94	0.72	0.94	22.9	
Approach		124	17	124	17	0.381	40	LOS D	3.9	31.2	0.93	0.73	0.93	30.2	
All Vehicles		1838	5.7	1838	5.7	0.725	16.1	LOS B	15.6	119	0.64	0.6	0.65	30.1	

Main St\_Plaza Turn Intersection - AM Peak

2029

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	228	0	228	0	0.329	4.6	LOS A	0	0	0	0.25	0	48	
2	T1	273	9	273	9	0.329	0.1	LOS A	0	0	0	0.25	0	46.8	
Approach		501	4.9	501	4.9	0.329	2.1	NA	0	0	0	0.25	0	47.6	
North: Main Street (N)															
8	T1	192	9.6	192	9.6	0.107	0	LOS A	0	0	0	0.01	0	51.6	
9	R2	580	0	580	0	0.545	8.6	LOS A	3.8	27.8	0.6	0.91	0.87	40.8	
Approach		772	2.4	772	2.4	0.545	6.5	NA	3.8	27.8	0.45	0.69	0.65	42.8	
West: Plaza Turn (W)															
10	L2	407	2.8	407	2.8	0.448	6.3	LOS A	2	14.8	0.43	0.66	0.5	42.7	
12	R2	70	0	70	0	0.234	17.4	LOS C	0.9	6.5	0.8	0.93	0.87	39	
Approach		477	2.4	477	2.4	0.448	7.9	LOS A	2	14.8	0.49	0.7	0.55	41.8	
All Vehicles		1750	3.1	1750	3.1	0.545	5.6	NA	3.8	27.8	0.33	0.57	0.44	43.9	

Main Street / The Parkway Intersection - PM Peak

2029

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
<b>South: Main Street (S)</b>															
1	L2	34	31.2	34	31.2	0.142	10.7	LOS B	2	15.9	0.38	0.4	0.38	43.4	
2	T1	618	4	618	4	0.71	9.7	LOS A	15.7	119.5	0.6	0.57	0.6	28.2	
3	R2	83	1.5	83	1.5	0.71	15	LOS B	15.7	119.5	0.64	0.6	0.64	39.2	
Approach		735	5	735	5	0.71	10.4	LOS B	15.7	119.5	0.59	0.57	0.59	31.8	
<b>East: The Parkway (E)</b>															
4	L2	50	0	50	0	0.135	36.9	LOS D	1.8	13.5	0.86	0.72	0.86	25.1	
5	T1	68	0	68	0	0.673	41.5	LOS D	7.1	53.3	0.99	0.86	1.08	31.2	
6	R2	93	3.3	93	3.3	0.673	46.2	LOS D	7.1	53.3	0.99	0.86	1.08	24.5	
Approach		210	1.4	210	1.4	0.673	42.5	LOS D	7.1	53.3	0.96	0.83	1.03	27.3	
<b>North: Main Street (N)</b>															
7	L2	124	2	124	2	0.425	11.8	LOS B	9.3	71.6	0.48	0.5	0.48	41.2	
8	T1	354	5.3	354	5.3	0.425	7.2	LOS A	9.3	71.6	0.48	0.5	0.48	23.3	
9	R2	18	50.1	18	50.1	0.068	19.3	LOS B	0.4	4.5	0.56	0.66	0.56	35.6	
Approach		495	6.1	495	6.1	0.425	8.8	LOS A	9.3	71.6	0.49	0.51	0.49	33.2	
<b>West: The Parkway (W)</b>															
10	L2	65	12.9	65	12.9	0.484	39.2	LOS D	5.4	42.3	0.91	0.75	0.91	26.9	
11	T1	74	1.5	74	1.5	0.484	34.4	LOS C	5.4	42.3	0.91	0.75	0.91	33.5	
12	R2	44	26.9	44	26.9	0.25	44.8	LOS D	1.8	16.3	0.93	0.74	0.93	23.3	
Approach		184	11.7	184	11.7	0.484	38.6	LOS D	5.4	42.3	0.92	0.75	0.92	29.3	
All Vehicles		1624	5.6	1624	5.6	0.71	17.2	LOS B	15.7	119.5	0.64	0.6	0.65	30.2	

Main St\_Plaza Turn Intersection - PM Peak

2029

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	89	0	89	0	0.246	4.6	LOS A	0	0	0	0.16	0	48.7	
2	T1	229	9.6	229	9.6	0.246	0.1	LOS A	0	0	0	0.16	0	48.1	
Approach		318	6.9	318	6.9	0.246	1.3	NA	0	0	0	0.16	0	48.4	
North: Main Street (N)															
8	T1	213	10.6	213	10.6	0.12	0	LOS A	0	0	0	0.01	0	51.6	
9	R2	284	0	284	0	0.215	5.9	LOS A	0.9	6.6	0.33	0.6	0.33	43.1	
Approach		497	4.5	497	4.5	0.215	3.4	NA	0.9	6.6	0.19	0.35	0.19	46.1	
West: Plaza Turn (W)															
10	L2	464	0	464	0	0.548	6.4	LOS A	2.6	18.8	0.4	0.65	0.5	42.6	
12	R2	45	0	45	0	0.087	9.9	LOS A	0.3	2.4	0.59	0.79	0.59	42.7	
Approach		509	0	509	0	0.548	6.7	LOS A	2.6	18.8	0.42	0.67	0.51	42.6	
All Vehicles		1324	3.4	1324	3.4	0.548	4.2	NA	2.6	18.8	0.23	0.42	0.27	45.2	

## Main Street / The Parkway Intersection - AM Peak

2034

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	39	29.8	39	29.8	0.157	9.4	LOS A	2.5	20.3	0.34	0.36	0.34	44.2	
2	T1	691	4.3	691	4.3	0.784	12.2	LOS B	18.1	138.7	0.61	0.62	0.65	25.6	
3	R2	82	1.3	82	1.3	0.784	18.7	LOS B	18.1	138.7	0.68	0.68	0.74	36.8	
Approach		812	5.3	812	5.3	0.784	12.7	LOS B	18.1	138.7	0.61	0.61	0.65	29.2	
East: The Parkway (E)															
4	L2	43	0	43	0	0.154	40.8	LOS D	1.7	12.8	0.9	0.72	0.9	23.9	
5	T1	83	1.3	83	1.3	0.77	45.8	LOS D	7.5	59.1	1	0.93	1.22	30.2	
6	R2	78	11.3	78	11.3	0.77	50.7	LOS D	7.5	59.1	1	0.94	1.22	23.3	
Approach		204	4.8	204	4.8	0.77	46.6	LOS D	7.5	59.1	0.98	0.89	1.15	26.8	
North: Main Street (N)															
7	L2	115	7	115	7	0.768	11.8	LOS B	16.3	124.6	0.53	0.52	0.53	41.5	
8	T1	643	3.1	643	3.1	0.768	7.1	LOS A	16.3	124.6	0.53	0.52	0.53	24.2	
9	R2	100	9.4	100	9.4	0.848	50.3	LOS D	4.7	36.7	0.68	1.01	1.32	23.1	
Approach		858	4.4	858	4.4	0.848	12.8	LOS B	16.3	124.6	0.54	0.58	0.63	27.9	
West: The Parkway (W)															
10	L2	26	40.8	26	40.8	0.408	43.1	LOS D	3.9	31.7	0.94	0.74	0.94	26	
11	T1	71	1.5	71	1.5	0.408	37.9	LOS D	3.9	31.7	0.94	0.74	0.94	32.9	
12	R2	27	35.1	27	35.1	0.192	47.7	LOS D	1.2	10.8	0.95	0.72	0.95	22.6	
Approach		124	17	124	17	0.408	41.1	LOS D	3.9	31.7	0.94	0.74	0.94	29.8	
All Vehicles		1998	5.6	1998	5.6	0.848	18	LOS B	18.1	138.7	0.64	0.63	0.71	28.3	

Main St\_Plaza Turn Intersection - AM Peak

2034

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	228	0	228	0	0.345	4.6	LOS A	0.6	4.3	0	0.2	0	48.3	
2	T1	404	7.8	404	7.8	0.345	0	LOS A	0.6	4.3	0	0.2	0	47.5	
Approach		632	5	632	5	0.345	1.7	NA	0.6	4.3	0	0.2	0	47.9	
North: Main Street (N)															
8	T1	223	8.9	223	8.9	0.218	1.4	LOS A	0.8	6.3	0.5	0.02	0.5	47.5	
9	R2	580	0	580	0	0.655	11	LOS B	4.8	35.6	0.75	1.09	1.26	39	
Approach		803	2.5	803	2.5	0.655	8.4	NA	4.8	35.6	0.68	0.8	1.05	40.9	
West: Plaza Turn (W)															
10	L2	407	2.8	407	2.8	0.758	11.1	LOS B	3.9	29.5	0.54	1.03	1.13	38.5	
12	R2	70	0	70	0	0.3	22.7	LOS C	1.1	8.3	0.86	0.98	1	36.7	
Approach		477	2.4	477	2.4	0.758	12.8	LOS B	3.9	29.5	0.59	1.03	1.11	38.1	
All Vehicles		1912	3.3	1912	3.3	0.758	7.3	NA	4.8	35.6	0.43	0.66	0.72	42.2	

Main Street / The Parkway Intersection - PM Peak

2034

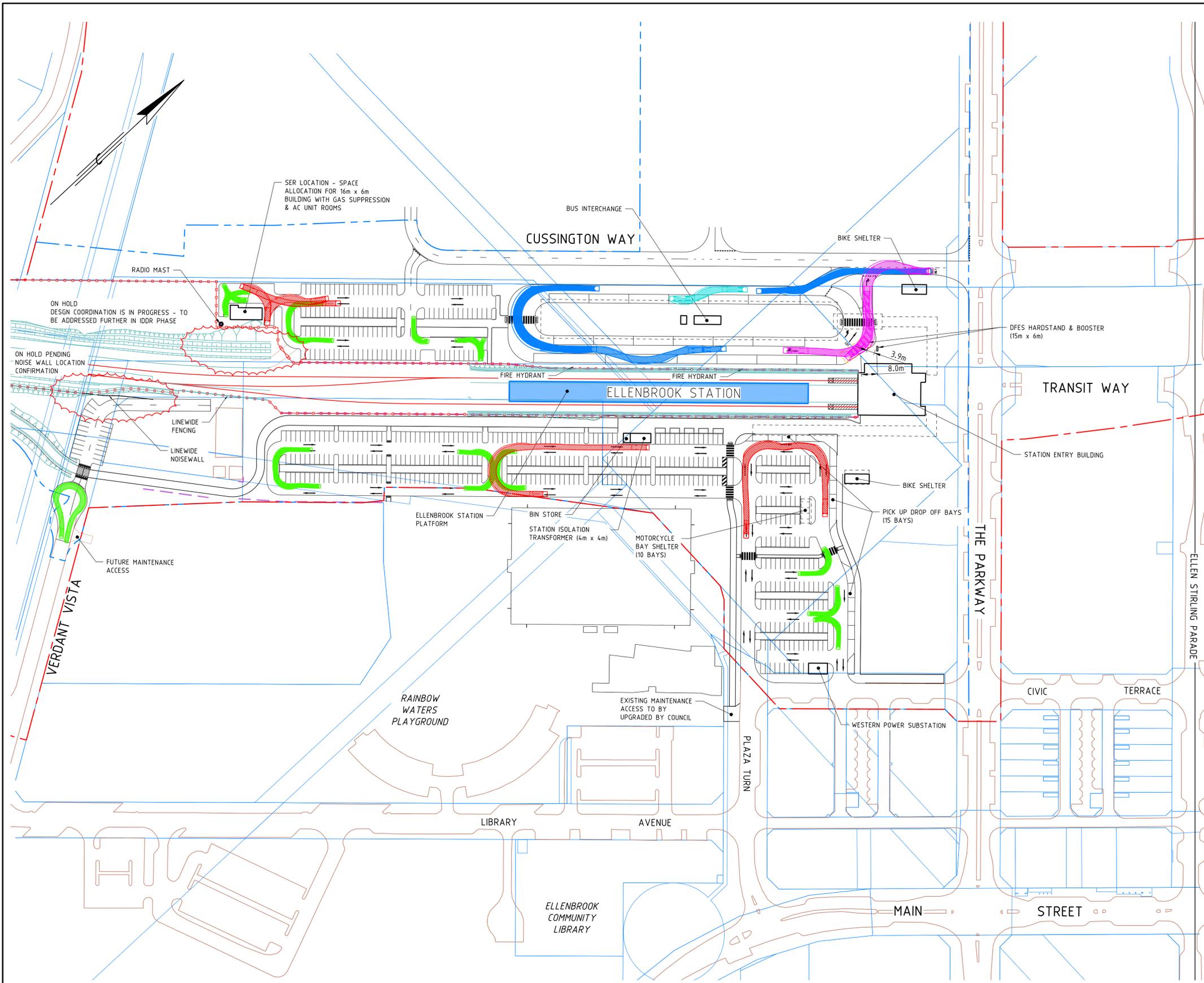
Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
<b>South: Main Street (S)</b>															
1	L2	34	31.2	34	31.2	0.149	10.5	LOS B	2.6	20.3	0.38	0.38	0.38	43.6	
2	T1	728	4	728	4	0.746	9.5	LOS A	18	137.2	0.6	0.58	0.6	28.5	
3	R2	83	1.5	83	1.5	0.746	15	LOS B	18	137.2	0.66	0.62	0.66	39.3	
Approach		845	4.9	845	4.9	0.746	10.1	LOS B	18	137.2	0.6	0.57	0.6	31.7	
<b>East: The Parkway (E)</b>															
4	L2	50	0	50	0	0.144	37.9	LOS D	1.9	13.9	0.87	0.73	0.87	24.8	
5	T1	68	0	68	0	0.722	43.5	LOS D	7.3	54.7	1	0.89	1.14	30.7	
6	R2	93	3.3	93	3.3	0.722	48.3	LOS D	7.3	54.7	1	0.9	1.15	23.9	
Approach		210	1.4	210	1.4	0.722	44.3	LOS D	7.3	54.7	0.97	0.86	1.08	26.8	
<b>North: Main Street (N)</b>															
7	L2	124	2	124	2	0.447	11.4	LOS B	9.8	75.2	0.48	0.5	0.48	41.5	
8	T1	383	5.3	383	5.3	0.447	6.8	LOS A	9.8	75.2	0.48	0.5	0.48	23.9	
9	R2	18	50.1	18	50.1	0.082	20.7	LOS C	0.5	4.8	0.59	0.67	0.59	34.8	
Approach		525	6.1	525	6.1	0.447	8.4	LOS A	9.8	75.2	0.48	0.5	0.48	33.3	
<b>West: The Parkway (W)</b>															
10	L2	65	12.9	65	12.9	0.502	40.3	LOS D	5.5	43	0.92	0.76	0.92	26.5	
11	T1	74	1.5	74	1.5	0.502	35.5	LOS D	5.5	43	0.92	0.76	0.92	33.2	
12	R2	44	23.8	44	23.8	0.266	46.7	LOS D	1.9	16.4	0.95	0.74	0.95	22.7	
Approach		184	10.9	184	10.9	0.502	39.9	LOS D	5.5	43	0.93	0.76	0.93	28.9	
All Vehicles		1763	5.4	1763	5.4	0.746	16.8	LOS B	18	137.2	0.64	0.6	0.66	30	

Main St\_Plaza Turn Intersection - PM Peak

2034

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows			Arrival Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %	Total veh/h	HV %	Vehicles veh				Distance m					
South: Main Street (S)															
1	L2	89	0	89	0	0.412	4.7	LOS A	0	0	0	0.11	0	48.8	
2	T1	339	8.2	339	8.2	0.412	0.1	LOS A	0	0	0	0.11	0	48.5	
Approach		428	6.5	428	6.5	0.412	1	NA	0	0	0	0.11	0	48.6	
North: Main Street (N)															
8	T1	242	10.2	242	10.2	0.136	0	LOS A	0	0	0	0.01	0	51.5	
9	R2	284	0	284	0	0.245	6.5	LOS A	1	7.3	0.42	0.66	0.42	42.5	
Approach		526	4.7	526	4.7	0.245	3.5	NA	1	7.3	0.23	0.36	0.23	45.9	
West: Plaza Turn (W)															
10	L2	464	0	464	0	0.769	10.5	LOS B	4.6	33.5	0.5	0.95	1.03	39	
12	R2	45	0	45	0	0.107	11.9	LOS B	0.4	2.9	0.67	0.86	0.67	41.7	
Approach		509	0	509	0	0.769	10.6	LOS B	4.6	33.5	0.52	0.94	0.99	39.4	
All Vehicles		1462	3.6	1462	3.6	0.769	5.3	NA	4.6	33.5	0.26	0.49	0.43	44.1	

## Appendix E – Swept path analysis drawing



PLAN  
1:1000

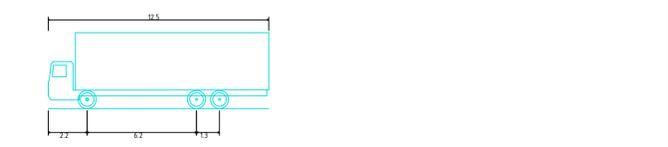
- NOTES**
- THIS DRAWING SET IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWING SETS
    - PRECINCT ARCHITECTURAL (25-A-291-AR)
    - PRECINCT STRUCTURAL (25-A-291-ST)
    - PRECINCT LANDSCAPING (25-A-291-LA)
    - PRECINCT HYDRAULICS (25-A-291-PL)
    - LINEWIDE RAIL (25-C)
    - LINEWIDE HIGHWAYS (25-C)
  - ALL DIMENSIONS ARE SHOWN IN METRES UNLESS OTHERWISE NOTED.
  - VEHICLE MOVEMENTS HAVE BEEN TRACKED USING AUSTRROADS 2013 VEHICLE SPECIFICATIONS. TRACKING SPEED FOR TURNING MOVEMENTS FOR ALL VEHICLES - 5km/h FORWARD, 2.5km/h REVERSE.

- LEGEND**
- 645 EXISTING CADASTRE BOUNDARY
  - ELLENBROOK MASTERPLAN LAYOUT
  - LINEWIDE RAIL EARTHWORKS
  - DEVELOPMENT ENVELOPE
  - INDICATIVE PROJECT FOOTPRINT
  - RAIL ALIGNMENT



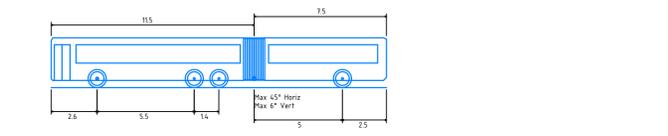
**B99 VEHICLE (REALISTIC MIN RADIUS) (2004) - COVERS 4WD**

OVERALL LENGTH 5.200m  
 OVERALL WIDTH 1.940m  
 OVERALL BODY HEIGHT 1.810m  
 MIN BODY GROUND CLEARANCE 0.272m  
 TRACK WIDTH 1.840m  
 LOCK-TO-LOCK TIME 4.00s  
 CURB TO CURB TURNING RADIUS 6.250m



**SINGLE UNIT TRUCK/BUS (12.5m)**

OVERALL LENGTH 12.500m  
 OVERALL WIDTH 2.500m  
 OVERALL BODY HEIGHT 4.300m  
 MIN BODY GROUND CLEARANCE 0.490m  
 TRACK WIDTH 2.500m  
 LOCK-TO-LOCK TIME 6.00s  
 CURB TO CURB TURNING RADIUS 12.500m



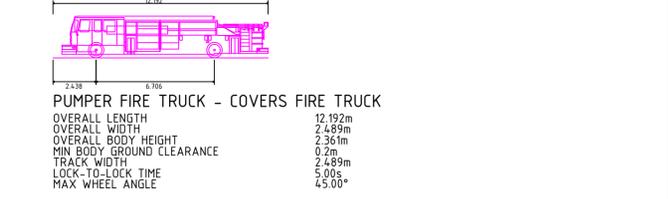
**ARTICULATED BUS (19.0m)**

OVERALL LENGTH 19.000m  
 OVERALL WIDTH 2.500m  
 OVERALL BODY HEIGHT 2.823m  
 MIN BODY GROUND CLEARANCE 0.427m  
 TRACK WIDTH 2.500m  
 LOCK-TO-LOCK TIME 6.00s  
 CURB TO CURB TURNING RADIUS 15.000m



**SERVICE VEHICLE (8.8m - COVERS REFUSE VEHICLE)**

OVERALL LENGTH 8.800m  
 OVERALL WIDTH 2.500m  
 OVERALL BODY HEIGHT 3.632m  
 MIN BODY GROUND CLEARANCE 0.427m  
 TRACK WIDTH 2.500m  
 LOCK-TO-LOCK TIME 4.00s  
 CURB TO CURB TURNING RADIUS 9.000m



**REFERENCE DESIGN**

REV	DATE	REFERENCE DESIGN	AMENDMENT	TD	KR	MM	MA
A	10.06.21	REFERENCE DESIGN					
ORIG SIZE	0 10 20 30 40 50 100mm			This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.			
A1	AT ORIGINAL PLOT SIZE						



REFERENCES	SCALE	DESIGNED
	1:1000m	T.DALAL
	DATUM	DRAWN
	HORIZONTAL: PCG2020	K.RASHEED
	VERTICAL: AHD	CHECKED
		M.MONTEIRO
		APPROVED
		M.MARAVIND
		DATE
		10.06.21

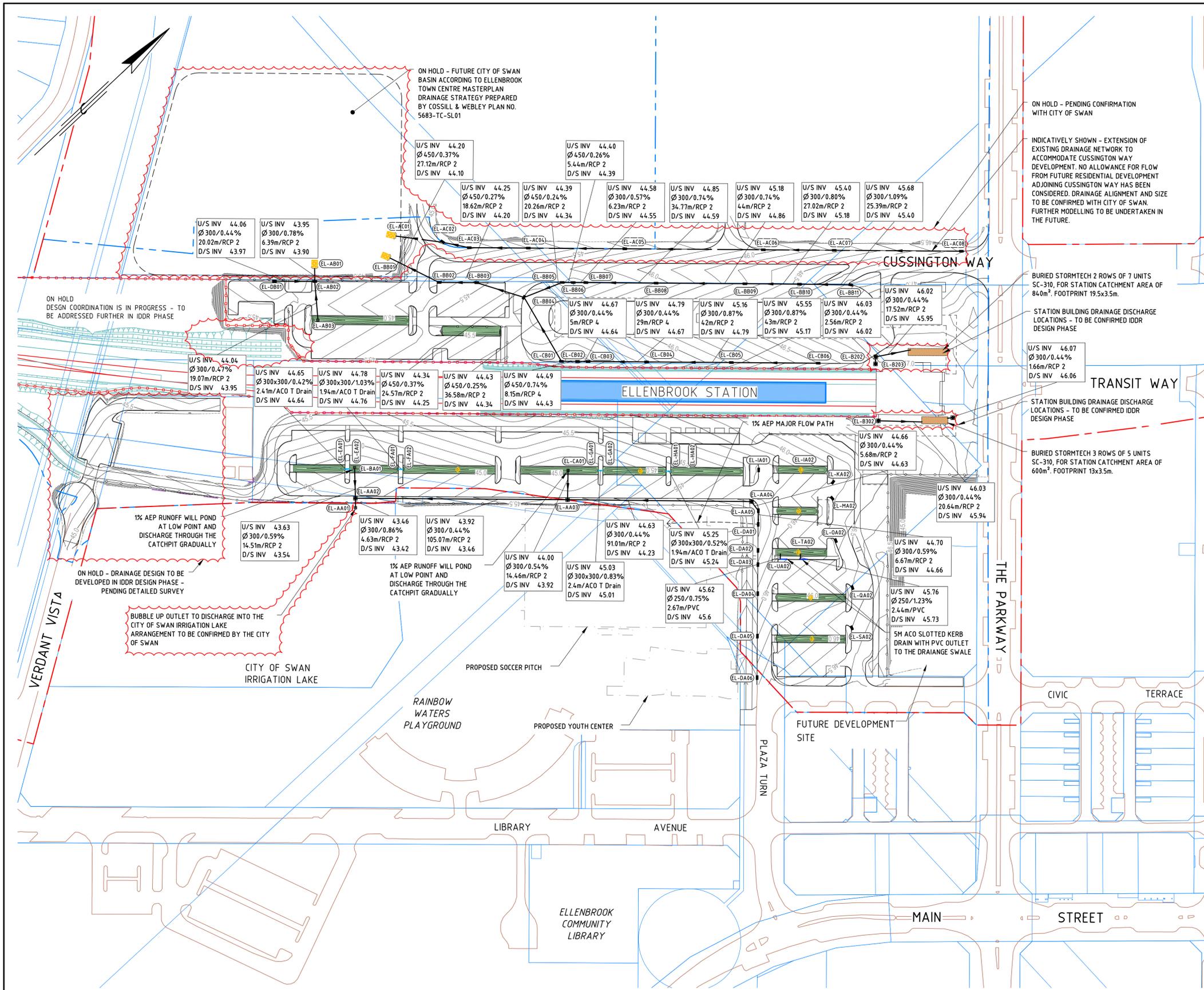
Government of Western Australia  
Public Transport Authority

**MORLEY ELLENBROOK LINE**

ELLENBROOK PRECINCT  
CIVIL - VEHICLE TRACKING  
PLAN

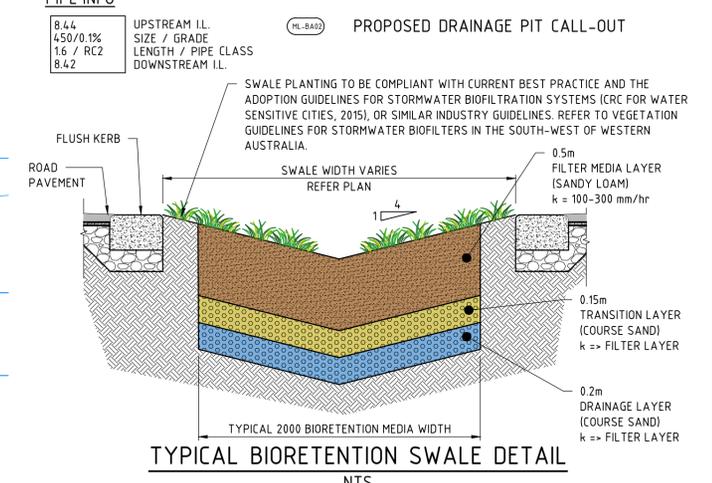
PTA Drawing No: 25-A-291-CI0135 Rev: A

## Appendix F – Stormwater



- ### NOTES
- THIS DRAWING SET IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWING SETS
    - PRECINCT ARCHITECTURAL (25-A-291-AR)
    - PRECINCT STRUCTURAL (25-A-291-ST)
    - PRECINCT LANDSCAPING (25-A-291-LA)
    - PRECINCT HYDRAULICS (25-A-291-PL)
    - LINEWIDE RAIL (25-C)
    - LINEWIDE HIGHWAYS (25-C)
  - ALL DIMENSIONS ARE SHOWN IN METRES UNLESS OTHERWISE NOTED.
  - THE PROPOSED SURFACE HAS BEEN DESIGNED TO ENSURE THAT SURFACE WATER RUNOFF RESULTING FROM THE MAJOR STORM EVENT (1% AEP) WILL NOT IMPACT CRITICAL INFRASTRUCTURE.
  - THE DESIGN GROUNDWATER LEVEL IS 2% AEP GROUNDWATER LEVEL AND VARIES FROM APPROX. +42.80m AHD TO +44.20m AHD (GENERALLY INCREASING SOUTH TO NORTH). REFER MEL GROUNDWATER MODEL, REFERENCE TIN-GROUNDWATER-ELLENBROOK-AEP002-20210325
  - THE DESIGN PERMEABILITY VALUE OF  $5.8 \times 10^{-4}$  m/s (5 m/DAY) HAS BEEN ADAPTED FOR THE ENTIRE SITE, BASED ON A REVIEW OF THE ADVISORY GEOTECHNICAL INVESTIGATION MEL-ADV-GE-RPT-00010 20201215 AND FURTHER INFILTRATION TEST RESULTS RECEIVED IN APRIL 2021 PERMEABILITY. INFILTRATION RATE FOR SOAKWELLS HAS BEEN REDUCED TO 3 m/DAY TO ACCOUNT FOR CLOGGING FACTOR.
  - FOR STATION AND BUS INTERCHANGE ROOF DRAINAGE ARRANGEMENT REFER TO ELLENBROOK STATION HYDRAULICS DRAWINGS.
  - HEADWALL END TREATMENT ROCK PITCHING IS FACING CLASS AS PER MRWA SPECIFICATION 406 UNLESS NOTED OTHERWISE. HEADWALL MORTAR ROCK PITCHING SHALL BE AS PER MRWA 200131-064 WITH ROCK PITCHING EXTEND FOR 1M BEHIND HEADWALL AND WINGWALLS AND AT OUTLETS INCLUDING TOE PROTECTION.
  - DRAIN BLOCK ROCK PITCHING SHALL BE AS PER MRWA SPECIFICATION 406 FOR LANDSCAPE: MORTARED ROCK PITCHING - 1m LONG X 200mm DEEP USING 150mm SIZE ROCKS.
  - ALL THE STREET GULLIES IN THE CARPARK AREA ARE SOAKWELLS AND THE PITS IN THE BUS STOP HAVE IMPERMEABLE LINERS.

- ### LEGEND
- ELLENBROOK MASTER PLAN LAYOUT
  - RAIL ALIGNMENT
  - PROPOSED RETAINING WALL
  - LINEWIDE RAIL EARTHWORKS
  - DEVELOPMENT ENVELOPE
  - INDICATIVE PROJECT FOOTPRINT
  - EXISTING CADASTRAL BOUNDARY
  - DRAINAGE SWALE / BIO-RETENTION / TREATMENT AREA
  - PROPOSED FENCE AND GATE (TYPE 1/TYPE 2)
  - PROPOSED LINWIDE FENCE (TYPE 3/TYPE 4 OR CUSTOM FENCE)
  - PROPOSED MAJOR CONTOURS
  - PROPOSED MINOR CONTOURS
  - PROPOSED DRAINAGE PIPE, FLOW DIRECTION
  - PROPOSED CATCHPIT/BUBBLE-UP PIT
  - PROPOSED STREET GULLY
  - PROPOSED DRAINAGE MANHOLE
  - PROPOSED HEADWALL WITH ROCK PROTECTION
  - PROPOSED DRAIN BLOCKS
  - ACO K1-1013 NEUTRAL TRENCH DRAIN OR APPROVED EQUIVALENT
  - ACO QK200SM SLOTTED KERBDRAIN
  - BURIED DRAINAGE DETENTION STORAGE. STORMTECH OR APPROVED EQUIVALENT



PLAN  
1:1000

REV	DATE	REFERENCE DESIGN	AMENDMENT	TD	KR	MM	MA
A	10.06.21	REFERENCE DESIGN					
ORIG SIZE	0 10 20 30 40 50 100mm			This document must not be copied without PTA's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorised purpose.			
A1	AT ORIGINAL PLOT SIZE						



REFERENCES	SCALE	DESIGNED
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	DATUM	DRAWN
	HORIZONTAL: PCG2020	K.RASHEED
	VERTICAL: AHD	CHECKED
		M.MONTEIRO
		APPROVED
		M.MARAVIND
		DATE
		10.06.21

## REFERENCE DESIGN

Government of Western Australia  
Public Transport Authority

### MORLEY ELLENBROOK LINE

ELLENBROOK PRECINCT  
CIVIL - DRAINAGE AND FINISHED SURFACE  
PLAN

PTA Drawing No: 25-A-291-CI0010      Rev: A

## Appendix G – EPA Ministerial Statement

**THIS DOCUMENT**

This document has been produced by the Office of the Appeals Convenor as an electronic version of the original Statement for the proposal listed below as signed by the Minister and held by this Office. Whilst every effort is made to ensure its accuracy, no warranty is given as to the accuracy or completeness of this document.

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Published on: 15 December 2020

Statement No. 1156

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED**  
***(Environmental Protection Act 1986)***

**MALAGA TO ELLENBROOK RAIL WORKS**

**Proposal:** The proposal is to construct and operate a new 13 kilometre railway line between Malaga and Ellenbrook in the City of Swan. The proposal includes the construction of new train stations and associated facilities at Malaga, Whiteman Park and Ellenbrook and a potential future station at Bennett Springs.

**Proponent:** Public Transport Authority of Western Australia  
Australian Business Number 61 850 109 576

**Proponent Address:** Public Transport Centre, West Parade  
PERTH WA 6000

**Assessment Number:** 2238

**Report of the Environmental Protection Authority:** 1690

Pursuant to section 45 of the *Environmental Protection Act 1986*, it has been agreed that the proposal described and documented in Table 1 of Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

**1 Proposal Implementation**

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 of Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have been approved under the *Environmental Protection Act 1986*.

**2 Contact Details**

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

### **3 Time Limit for Proposal Implementation**

- 3-1 The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any commencement, prior to this date, must be substantial.
- 3-2 Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

### **4 Compliance Reporting**

- 4-1 The proponent shall prepare, and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation of the proposal, whichever is sooner.
- 4-2 The Compliance Assessment Plan shall indicate:
  - (1) the frequency of compliance reporting;
  - (2) the approach and timing of compliance assessments;
  - (3) the retention of compliance assessments;
  - (4) the method of reporting of potential non-compliances and corrective actions taken;
  - (5) the table of contents of Compliance Assessment Reports; and
  - (6) public availability of Compliance Assessment Reports.
- 4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.
- 4-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.
- 4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.
- 4-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

- (1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;
- (2) include a statement as to whether the proponent has complied with the conditions;
- (3) identify all potential non-compliances and describe corrective and preventative actions taken;
- (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and
- (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

## **5 Public Availability of Data**

5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

5-2 If any data referred to in condition 5-1 contains particulars of:

- (1) a secret formula or process; or
- (2) confidential commercially sensitive information;

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

## **6 Bennett Brook – Social Surroundings (Aboriginal Heritage), Inland Waters, Terrestrial Fauna**

6-1 The proponent shall design and manage the implementation of the proposal to meet the following environmental objective:

- (1) maintain the hydrological regime and water quality in Bennett Brook that supports:
  - (a) important Aboriginal cultural associations and heritage;
  - (b) Carter's freshwater mussel (*Westralunio carteri*); and

- (c) the **ecological integrity** of Bennett Brook, incorporating **Conservation Category Wetland Unique Feature Identifier 15259**.

- 6-2 To ensure that the objective of condition 6-1 is being met, the proponent shall:
- (1) construct bridge footings or pillars, drainage structures and abutments outside of the bed and banks of Bennett Brook;
  - (2) ensure no excavation activities occur within the bed of Bennett Brook;
  - (3) not dispose or discharge dewatered effluent to the Bennett Brook or its tributaries;
  - (4) not allow access for the purposes of construction activities within the bed of Bennett Brook with the exception of tree removal necessary for bridge construction, unless agreed in writing by the CEO; and
  - (5) within twelve (12) months following construction of the proposal, undertake **rehabilitation** of areas temporarily disturbed during construction with locally native species to reinstate fauna habitat.

## **7 Social Surroundings (Aboriginal Heritage)**

- 7-1 The proponent shall consult with appropriate and relevant Whadjuk Noongar representatives regarding how access to **Registered Sites** 551 and 552 can be maintained for the purpose of cultural practice.
- 7-2 The proponent shall undertake consultation with appropriate and relevant Whadjuk Noongar representatives and Registered Knowledge Holder families of Bennett Brook prior to and during construction of the Bennett Brook rail bridge regarding the retention of **paperbark trees** at and adjacent to the Bennett Brook crossing.
- 7-3 Prior to commencement of construction activities at Bennett Brook, the proponent shall provide evidence to the CEO of the consultation required by condition 7-2, including how input received was addressed.

## **8 Construction Impacts – Flora and Vegetation, Terrestrial Fauna, Inland Waters**

- 8-1 During construction of the proposal the proponent shall:
- (1) not clear more than:
    - (a) 10.05 ha of Banksia woodlands of the Swan Coastal Plain priority ecological community;
    - (b) 81.4 ha of Carnaby's cockatoo (*Calyptorhynchus latirostris*) **foraging habitat**;

- (c) 68.1 ha of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) **foraging habitat**; and
  - (d) 423 **black cockatoo** potential breeding trees.
- (2) implement hygiene protocols, consistent with the ***Management of Phytophthora cinnamomi for Biodiversity Conservation in Australia, Part 2 National Best Practice Guidelines*** as amended or replaced from time to time;
  - (3) manage soil and groundwater disturbing activities in accordance with the Acid Sulfate Soil Guideline Series *Identification and investigation of acid sulfate soils and acidic landscapes* (2015) and *Treatment and management of soils and water in acid sulfate soil landscapes* (2015), or any approved update of these guidelines;
  - (4) not dispose of dewatered effluent to **Conservation Category Wetlands** or **Resource Enhancement Wetlands**;
  - (5) not locate **abstraction bores** within fifty (50) metres of:
    - (a) identified Banksia woodlands; or
    - (b) **Conservation Category Wetlands**,  
that are located adjacent to the **development envelope** or within native vegetation retention areas (**NVRA**);
  - (6) ensure that no refuelling, chemical storage or stockpiling occurs within fifty (50) metres of a **Conservation Category Wetland**;
  - (7) undertake weed control and management measures to prevent the introduction or spread of weeds;
  - (8) implement measures to ensure there are no direct or **indirect impacts**, when compared to pre-construction **baseline conditions**, to native vegetation or wetlands in **NVRA**, or directly adjacent to the **development envelope** from dewatering activities; and
  - (9) implement measures to minimise indirect threatening processes, including grazing, on native vegetation within the **Patch 1 Malaga NVRA**.

8-2 Following construction of the proposal, the proponent shall:

- (1) ensure there are no direct or **indirect impacts**, when compared to pre-construction **baseline conditions**, to native vegetation within the **NVRA** within five (5) years post construction that are attributable to the proposal;

- (2) undertake weed control and management for five (5) years post construction within:
  - (a) the **NVRA**;
  - (b) Bush Forever site 304 in the **development envelope**; and
  - (c) Bush Forever site 304 within twenty (20) metres of the **development envelope**.
- (3) implement measures for three (3) years post construction to manage indirect threatening processes, including grazing, within the **Patch 1 Malaga NVRA**, to ensure vegetation structure and condition is maintained when compared to pre-construction **baseline conditions**;
- (4) within twelve (12) months, undertake **rehabilitation** of native vegetation with locally native species to achieve pre-construction vegetation densities in all areas disturbed during construction activities that are not required for the ongoing operation of the proposal; and
- (5) undertake annual monitoring and any remedial measures to ensure **rehabilitation** required by condition 8-2(4) will successfully establish within five (5) years post construction.

8-3 The proponent shall prepare and submit a report to demonstrate that the requirements of condition 8-2 have been met. The first report shall be submitted within three (3) months of the completion of construction and then annually with the Compliance Assessment Report, until the CEO has confirmed by notice in writing that the requirements of condition 8-2 have been met.

## **9 Malaga Dive Structure – Inland Waters and Flora and Vegetation**

9-1 The proponent shall manage dewatering, excavation activities, and the treatment, re-use and disposal of acid sulfate soils at the **Malaga dive structure** to meet the following environmental objective:

- (1) maintain the quality and hydrological regime of groundwater that supports the biological diversity and **ecological integrity** of:
  - (a) Banksia woodlands of the Swan Coastal Plain priority ecological community;
  - (b) **Conservation Category Wetlands**; and
  - (c) **Resource Enhancement Wetlands**.

9-2 Prior to excavation or dewatering activities associated with construction of the **Malaga dive structure**, whichever occurs first, the proponent shall:

- (1) undertake appropriate investigations for acid sulfate soils in accordance with the Department of Water and Environmental Regulation's acid sulfate soil guidelines for the identification and investigation of acid sulfate soils and acidic landscapes;
  - (2) prepare and submit an Acid Sulfate Soils and Dewatering Management Plan based on the findings of the investigations required by condition 9-2(1) and in accordance with the Department of Water and Environmental Regulation's acid sulfate soil guidelines for the treatment and management of soils and water in acid sulfate soil landscapes; and
  - (3) specify the measures to meet the objective in condition 9-1(1) in the Acid Sulfate Soils and Dewatering Management Plan.
- 9-3 The proponent shall implement the Acid Sulfate Soils and Dewatering Management Plan required by condition 9-2(2) which the CEO has advised in writing satisfies the requirements of condition 9-2(2).
- 9-4 Following the completion of construction of the **Malaga dive structure**, the proponent shall:
- (1) within thirty (30) days, prepare, in accordance with the Department of Water and Environmental Regulation's acid sulfate soil guidelines for the treatment and management of soils and water in acid sulfate soil landscapes, and submit, a report to demonstrate compliance with the Acid Sulfate Soils and Dewatering Management Plan required by condition 9-2(2);
  - (2) undertake post-dewatering monitoring for a minimum of six (6) months to determine whether the environmental objective specified in condition 9-1(1) is being met; and
  - (3) within thirty (30) days of the last monitoring event required by condition 9-4(2), prepare and submit a post-dewatering monitoring report to demonstrate compliance with the environmental objective specified in condition 9-1(1).
- 9-5 The proponent:
- (1) may review and revise the Acid Sulfate Soils and Dewatering Management Plan; or
  - (2) shall review and revise the Acid Sulfate Soils and Dewatering Management Plan as and when directed by the CEO by a notice in writing.
- 9-6 The proponent shall implement the latest revision of the Acid Sulfate Soils and Dewatering Management Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 9-2(2).

## 10 Terrestrial Fauna

10-1 The proponent shall undertake the following actions to minimise impacts to terrestrial fauna:

- (1) within seven (7) days prior to clearing, using a qualified and licensed terrestrial **fauna spotter(s)** with experience in surveying for **black cockatoos**, inspect all **potential nesting trees** with hollows within the **development envelope** to determine if any hollows are being used for nesting by **black cockatoos**; and
- (2) if any hollows are in use by **black cockatoos** for nesting, the proponent shall not **disturb** or clear the nesting tree, or vegetation within a ten (10) metre radius of the nesting tree, until after the cockatoos have naturally completed nesting (young have fledged and dispersed) and an appropriately qualified and licensed terrestrial **fauna spotter** has verified that the hollow(s) are no longer being used by the **black cockatoos**.

10-2 During activities associated with the construction of the proposal, the proponent shall undertake as required the following actions to minimise impacts to terrestrial fauna:

- (1) ensure the use of appropriately qualified and licensed terrestrial **fauna spotter(s)** during clearing activities;
- (2) ensure that during **trenching activities** inspection for, and clearing of, fauna from open trenches by appropriately qualified and licensed terrestrial fauna rescue personnel occurs at least twice daily and not more than one (1) hour prior to backfilling of trenches, with the first daily inspection and clearing to be undertaken no later than three (3) hours after sunrise prior to any construction, and the second inspection and clearing to be undertaken daily between the hours of 3:00 pm and 6:00 pm;
- (3) ensure that open trench lengths do not exceed a length capable of being inspected and cleared by appropriately qualified and licensed fauna rescue personnel within the required times set out in condition 10-2(2); and
- (4) provide egress points, ramps and/or fauna refuges that provide suitable shelter from the sun and predators for trapped fauna in open trenches at intervals not exceeding fifty (50) metres.

## 11 Social Surroundings (Noise)

11-1 The proponent shall implement the proposal to meet the following environmental objective:

- (1) minimise operational noise and vibration impacts on existing noise sensitive receptors **as far as practicable**.
- 11-2 At least three (3) months prior to the operation of the proposal, in order to meet the requirements of condition 11-1(1), the proponent shall submit a further revision of the Morley-Ellenbrook Rail Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan (Reference: 675.11323-R05, June 2020) to include:
- (1) the details of relevant noise mitigation measures to confirm that noise and vibration criteria will be met;
  - (2) an update to Section 5 Management Measures, to show the locations and minimum heights of noise walls; and
  - (3) demonstration that the design and construction of noise mitigation measures will meet the noise and vibration objectives set out in Section 2 Transport noise and vibration objectives.
- 11-3 The proponent shall implement the revised Morley-Ellenbrook Rail Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan, or the most recent version, which the CEO has confirmed by notice in writing satisfies the requirements of condition 11-2.
- 11-4 The proponent shall continue to implement the revised Morley-Ellenbrook Rail Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan, or any subsequently approved revisions until the CEO has confirmed by notice in writing that the proponent has demonstrated that the objective in condition 11-1(1) is being and will continue to be met.
- 11-5 In the event of failure to implement management actions detailed in the approved Morley-Ellenbrook Rail Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan, the proponent shall meet the requirements of condition 4-5 (Compliance Reporting) and shall implement the measures outlined in the approved Morley-Ellenbrook Rail Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan, including, but not limited to, actions and investigations to be undertaken.

## **12 Offsets**

- 12-1 The proponent shall undertake offsets to achieve the objective of counterbalancing the significant residual impact on the following environmental values as a result of the implementation of the proposal:
- (1) 10.05 ha of Banksia woodlands of the Swan Coastal Plain priority ecological community;
  - (2) 81.4 ha of Carnaby's cockatoo (*Calyptorhynchus latirostris*) **foraging habitat**;

- (3) 68.1 ha of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) **foraging habitat**;
- (4) 423 **black cockatoo** potential breeding trees;
- (5) 1.9 ha of **Conservation Category Wetlands**;
- (6) 0.5 ha of **Resource Enhancement Wetlands**; and
- (7) 17.2 ha of Bush Forever site 304,

### **On-ground Management Offset Plan**

12-2 Within twelve (12) months of the publication of this Statement or as otherwise agreed by the CEO, the proponent shall prepare and submit an On-ground Management Offset Plan to the requirements of the CEO, with the environmental objective of counterbalancing the significant residual impact to:

- (1) 1.9 ha of **Conservation Category Wetlands**;
- (2) 0.5 ha of **Resource Enhancement Wetlands**; and
- (3) 17.2 ha of Bush Forever site 304.

12-3 The On-ground Management Offset Plan required by condition 12-2 shall:

- (1) spatially define and map the vegetation condition of an area or areas within Whiteman Park, or other suitable location as agreed by the CEO, where **on-ground management** actions are proposed to counterbalance the significant residual impacts to the environmental values specified in condition 12-2;
- (2) detail the proposed **on-ground management** actions to be implemented, objectives and targets to be achieved, a timeframe for the actions to be undertaken, completion criteria, funding arrangements for these actions and any **contingency actions** to be undertaken within Whiteman Park, or other suitable location as agreed by the CEO;
- (3) define the role of the proponent and/or any relevant management authority or other third party involved in delivering the offset;
- (4) include evidence of consultation with stakeholders including:
  - (a) Department of Biodiversity, Conservation and Attractions;
  - (b) Department of Planning, Lands and Heritage; and
  - (c) Friends of Bennett Brook;
- (5) demonstrate how the **on-ground management** actions to be undertaken within Whiteman Park, or other suitable location as agreed

by the CEO, will result in a tangible improvement to the environmental values being offset;

- (6) demonstrate how the **on-ground management** actions counterbalance the significant residual impact to the environmental values identified in condition 12-2 through application of the principles of the WA Environmental Offsets Policy 2011 and completion of the WA Offsets Template, as described in the WA Environmental Offsets Guidelines 2014 or any subsequent revisions of these documents; and
- (7) detail the monitoring, reporting and evaluation mechanisms for actions identified under conditions 12-3(2).

12-4 The proponent:

- (1) may review and revise the On-ground Management Offset Plan; or
- (2) shall review and revise the On-ground Management Offset Plan as and when directed by the CEO by notice in writing.

12-5 The proponent shall implement the latest revision of the On-ground Management Offset Plan approved by the CEO by notice in writing.

12-6 The proponent shall continue to implement the On-ground Management Offset Plan until the CEO has confirmed by notice in writing that the proponent has demonstrated that the objective in condition 12-2 has been met.

12-7 The proponent shall notify the CEO within twenty-one (21) days if any of the actions or outcomes set out in the On-ground Management Offset Plan are unable to be achieved, and provide the detail and timing of **contingency actions** to be undertaken.

### **Offset Strategy**

12-8 Within six (6) months of the publication of this Statement, or as otherwise agreed by the CEO, the proponent shall prepare and submit an Offset Strategy to the requirements of the CEO, with the environmental objective of counterbalancing the significant residual impact to:

- (1) 10.05 ha of Banksia woodlands of the Swan Coastal Plain priority ecological community;
- (2) 81.4 ha of Carnaby's cockatoo (*Calyptorhynchus latirostris*) **foraging habitat**;
- (3) 68.1 ha of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) **foraging habitat**; and
- (4) 423 **black cockatoo** potential breeding trees.

12-9 The Offset Strategy required by condition 12-8 shall:

- (1) demonstrate that the objective in condition 12-8 will be met;
- (2) identify an area, or areas, (the **Proposed Offset Conservation Area**) to be **acquired** with **on-ground management**, managed for conservation purposes, and contains the environmental values identified in condition 12-8;
- (3) demonstrate how the environmental values within the **Proposed Offset Conservation Area** counterbalances the significant residual impact to the environmental values identified in condition 12-8(1), condition 12-8(2) and condition 12-8(3) through application of the principles of the WA Environmental Offsets Policy and completion of the WA Offsets Template, as described in the WA Environmental Offsets Guidelines 2014, and the *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy Assessment Guide (October 2012), or any subsequent revisions of these documents;
- (4) demonstrate that the **Proposed Offset Conservation Area** contains at least 1,269 **black cockatoo** breeding trees or potential breeding trees;
- (5) demonstrate how the **Proposed Offset Conservation Area** aligns with:
  - (a) Approved conservation advice (incorporating listing advice) for the Banksia woodlands of the Swan Coastal Plain Ecological Community 2016;
  - (b) Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan 2013; and
  - (c) Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksia naso*) Recovery Plan 2008,or any subsequent revisions of these documents;
- (6) identify how the **Proposed Offset Conservation Area** will be **acquired** and specify:
  - (a) a timeframe and quantum of works associated with establishing the **Proposed Offset Conservation Area**, including a contribution for maintaining the offset for at least seven (7) years after completion of purchase and details pertaining to monitoring, evaluating and reporting; and
  - (b) the **relevant management body** for the on-going management of the **Proposed Offset Conservation Area**, including its role,

and the role of the proponent, and confirmation in writing that the **relevant management body** accepts responsibility for its role.

- (7) where **on-ground management** is proposed:
- (a) state the objective(s) and target(s) to be achieved, including completion criteria, which result in a tangible improvement to the environmental value(s) being offset;
  - (b) demonstrate the consistency of the objective(s) and target(s) with the objectives of any relevant conservation advice and recovery plans;
  - (c) detail the **on-ground management** actions with associated timeframes for implementation, including **contingency actions**, to achieve the objective(s) and target(s) identified above; and
  - (d) detail the monitoring, reporting and evaluation mechanisms for the objective(s), target(s) and actions identified above.

12-10 The proponent:

- (1) may review and revise the Offset Strategy; or
- (2) shall review and revise the Offset Strategy as and when directed by the CEO by a notice in writing.

12-11 Where research project(s) are proposed to offset the significant residual impacts to Carnaby's cockatoo and forest red-tailed black cockatoo, the proponent shall prepare and submit with the Offset Strategy required by condition 12-8, a Black Cockatoo Research Plan to the requirements of the CEO that will increase the scientific knowledge of black cockatoos relevant to improving conservation and management of the species and its habitat in the Perth and Peel regions. The Black Cockatoo Research Plan shall:

- (1) demonstrate how the research project(s) will provide a positive and long-term conservation outcome for Carnaby's cockatoo and forest red-tailed black cockatoo and addresses agreed research priorities, considering key knowledge gaps identified in the EPA Technical Report: Carnaby's Cockatoo in Environmental Impact Assessment in the Perth and Peel Regions (2019), the relevant black cockatoo recovery plans and/or other research priorities agreed with the Department of Biodiversity, Conservation and Attractions;
- (2) identify the objectives and intended outcomes, and details of success criteria;

- (3) provide an implementation schedule including an outline of key activities, deliverables, stages of implementation, and milestones towards completion;
- (4) identify the agreed governance arrangements including stakeholder responsibilities for implementing the research, and agreements with any third parties involved and legal obligations;
- (5) identify any potential risks involved and appropriate **contingency actions**;
- (6) identify monitoring activities to assess progress with research implementation and for compliance purposes;
- (7) provide details on the:
  - (a) financial and financial auditing arrangements including project budget and recipients of funds if project(s) are to be undertaken by any third parties;
  - (b) funding arrangements including the methodology to determine the amount of funding to be spent on research project(s); and
  - (c) timing of funding for the research project(s);
- (8) identify procedures for reporting to the CEO and Department of Biodiversity, Conservation and Attractions, including the content, format, timing and frequency for reporting and provisions of data and information against the objectives and outcomes identified in condition 12-11(2); and
- (9) identify how the results of the research offset will be communicated and/or published in an **open access** format for the benefit of future assessments and public understanding of the species.

12-12 The proponent:

- (1) may review and revise the Black Cockatoo Research Plan; or
- (2) shall review and revise the Black Cockatoo Research Plan as and when directed by the CEO by notice in writing.

12-13 Within six (6) months of receiving notice in writing from the CEO, on advice of the Department of Biodiversity, Conservation and Attractions, that the Offset Strategy satisfies the requirements of conditions 12-8, 12-9 and/or 12-11 the proponent shall implement the actions in accordance with the approved Offset Strategy.

12-14 The proponent shall implement the latest version of the Offset Strategy, which the CEO has confirmed by notice in writing, satisfies the requirements of conditions 12-8, 12- 9 and/or 12-11.

12-15 The proponent shall notify the CEO within twenty-one (21) days if any of the actions or outcomes set out in the Offset Strategy are unable to be achieved, and provide the detail and timing of **contingency actions** to be undertaken.

[signed on 15 December 2020]

Hon Stephen Dawson MLC  
**MINISTER FOR ENVIRONMENT**

Table 1: Summary of the proposal

<b>Proposal title</b>	Malaga to Ellenbrook Rail Works
<b>Short description</b>	The proposal is to construct and operate a new 13 kilometre dual railway line from Malaga to Ellenbrook in the City of Swan. The proposal includes the construction and operation of new intermodal transit stations at Malaga, Whiteman Park and Ellenbrook, with provision for a future station at Bennett Springs East. The proposal includes construction of a principal shared path, bridge infrastructure (including over Gnangara Road), a dive structure, and construction laydown and access areas.

Table 2: Location and authorised extent of physical and operational elements

Column 1	Column 2	Column 3
Element	Location	Authorised extent
Clearing and disturbance for construction of the railway, stations, principal shared path, dive structure, drainage structures, fencing, bridges, noise walls, and construction laydown and access areas.	Located within the development envelope as shown in Figure 1.	Clearing and disturbance of no more than 249 ha of which 152.1 ha is native vegetation within a 463.8 ha development envelope.

Table 3: Abbreviations and Definitions

Acronym, Term or Abbreviation	Definition
<b>Abstraction bores</b>	Bores used for construction water supply.
<b>Acquired</b>	The protection of environmental values on an area of initially unprotected land for the purpose of conservation through improved security of tenure or restricting the use of land (e.g. ceding land to the Crown or perpetual conservation covenants). This includes upfront costs of establishing the offset site and the on-going management of costs of maintaining the offset for the long term.
<b>As far as practicable</b>	As far as reasonably achievable or feasible as determined by the CEO having regard to, among other things, local conditions and circumstances (including costs) and to the current state of technical knowledge.
<b>Baseline conditions</b>	The environmental conditions prior to being subject to pressures from a development or operation of concern. This may include natural environmental conditions that are largely un-impacted by human influences or state of the environment just prior to influences and effects of development.

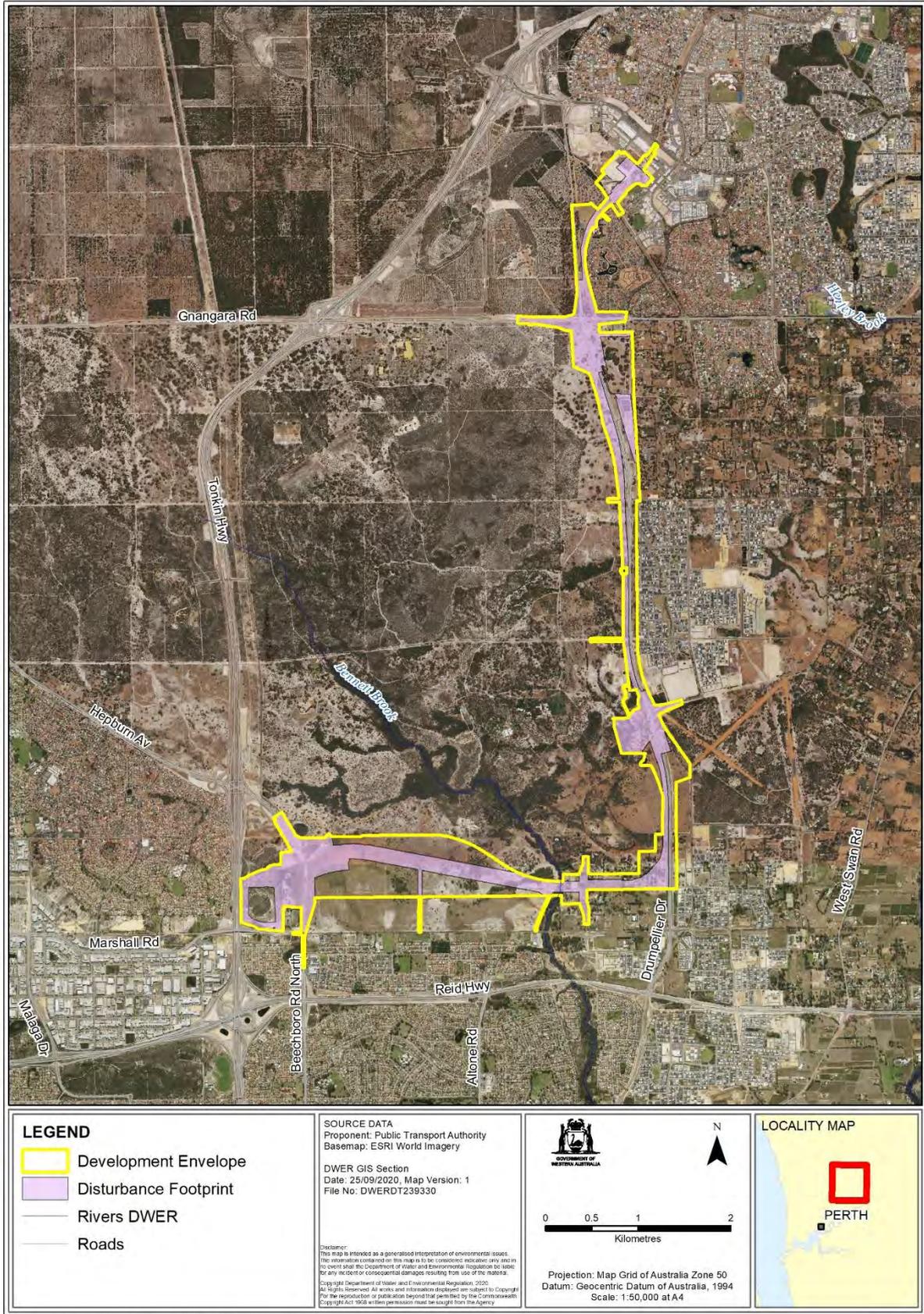
Acronym, Term or Abbreviation	Definition
<b>Black cockatoos</b>	Includes Carnaby's cockatoo ( <i>Calyptorhynchus latirostris</i> ), forest red-tailed black cockatoo ( <i>Calyptorhynchus banksii naso</i> ) and Baudin's cockatoo ( <i>Calyptorhynchus baudinii</i> ).
<b>Foraging habitat</b>	Foraging habitat described in <i>EPBC Act referral guidelines for three threatened black cockatoo species</i> (Commonwealth of Australia 2012), or any subsequent revisions of this document.
<b>CEO</b>	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or his delegate.
<b>Conservation Category Wetland</b>	As identified in the Geomorphic Wetlands of the Swan Coastal Plain (DBCA-019) dataset as updated from time-to-time.
<b>Contingency actions</b>	Actions to be implemented when monitoring determines that a management target may not be met, and where the actions will bring the impact within the management target.
<b>Development envelope</b>	The area within the yellow line marked in Figure 1 of this Statement and defined by coordinates in Schedule 2.
<b>Disturb</b>	Is to be defined as per the definition of 'disturb' in section 5 [subsection disturb — (a)(i)(ii)(iii) and (iv)] of the <i>Biodiversity Conservation Act 2016</i> .
<b>Ecological integrity</b>	Ecological integrity is the composition, structure, function and processes of ecosystems, and the natural variation of these elements.
<b>Fauna spotter</b>	A person who is qualified and licenced under section 40 of the <i>Biodiversity Conservation Act 2016</i> .
<b>ha</b>	Hectare
<b>Indirect impacts</b>	Any potential impacts outside the development envelope or to NVRA as a result of the clearing and disturbance authorised in Table 2 of Schedule 1. This includes but is not limited to: hydrological change, weed invasion, altered fire regimes, introduction or spread of disease, changes in erosion/deposition/accretion and edge effects.
<b>Malaga dive structure</b>	Where the railway extends below ground surface west of the Malaga station and connects to the Bayswater to Malaga rail line.

Acronym, Term or Abbreviation	Definition
<b><i>Management of <u>Phytophthora cinnamomi</u> for Biodiversity Conservation in Australia, Part 2, National Best Practice Guidelines</i></b>	E O’Gara, K Howard, B Wilson and GEstJ Hardy (2005) <i>Management of <u>Phytophthora cinnamomi</u> for Biodiversity Conservation in Australia: Part 2 – National Best Practice Guidelines</i> . A report funded by the Commonwealth Government Department of the Environment and Heritage by the Centre for Phytophthora Science and Management, Murdoch University, Western Australia, or any subsequent revisions of this document.
<b>NVRA</b>	Native vegetation retention areas, as shown in Figure 2 and defined by coordinates in Schedule 2
<b>On-ground management</b>	This includes revegetation (re-establishment of native vegetation in degraded areas) and rehabilitation (repair of ecosystem processes and management of weeds, disease or feral animals) with the objective to achieve a tangible improvement to the environmental values in the offset area.
<b>Open access</b>	The provision of free access to peer-reviewed, scholarly and research information to all, that removes restrictions on use and reuse.
<b>Paperbark trees</b>	<i>Melaleuca</i> tree species within the riparian zone or channel of Bennett Brook.
<b>Patch 1 Malaga NVRA</b>	Patch of Banksia woodlands of the Swan Coastal Plain priority ecological community located within the development envelope near the location of the proposed Malaga station, that will be retained within a NVRA, as shown in Figure 3 and defined by coordinates in Schedule 2.
<b>Potential nesting trees</b>	Any existing tree of a species known to support black cockatoo breeding which has a hollow and therefore may be being used for nesting.
<b>Proposed Offset Conservation Area</b>	The area of land identified in condition 12-9(2).
<b>Registered Sites</b>	Means a place to which the <i>Aboriginal Heritage Act 1972</i> applies by the operation of section 5 of that Act.
<b>Rehabilitation</b>	Repair of ecosystem processes and management of weeds, disease or feral animals.
<b>Relevant management body</b>	A party that is directly responsible for the on-going management of the Proposed Offset Conservation Area.
<b>Resource Enhancement Wetlands</b>	As identified in the Geomorphic Wetlands of the Swan Coastal Plain (DBCA-019) dataset as updated from time-to-time.

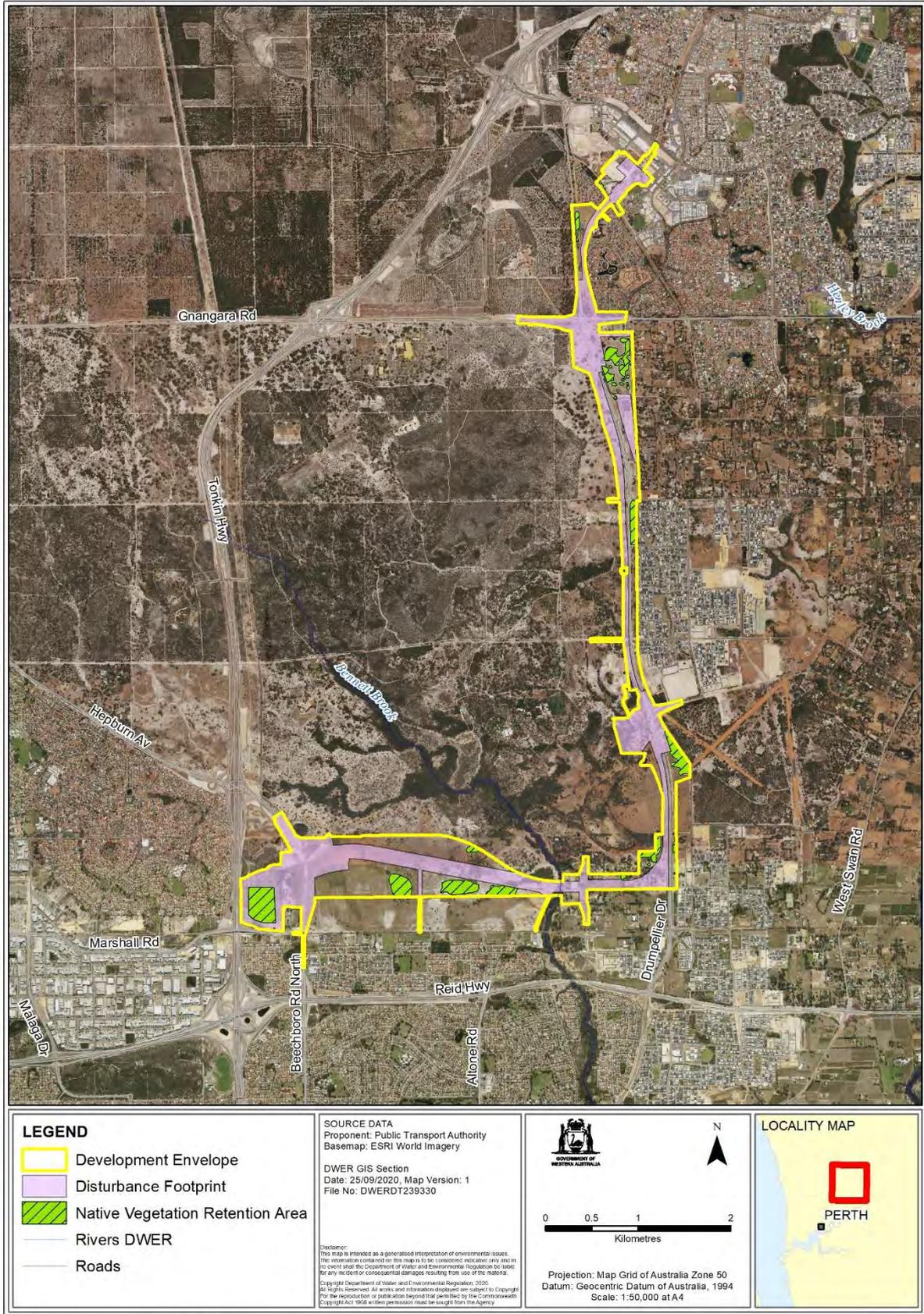
Acronym, Term or Abbreviation	Definition
<b>Trenching activities</b>	Trenches used for utilities such as communications. Trenches do not include excavation for the sinking of the railway line.

**Figures (attached)**

- Figure 1 Malaga to Ellenbrook Rail Works development envelope and disturbance footprint (This figure is a representation of the co-ordinates shown in Schedule 2)
  
- Figure 2 Native vegetation retention areas relevant to condition 8 (This figure is a representation of the co-ordinates shown in Schedule 2)
  
- Figure 3 Native vegetation retention area at Patch 1 Malaga relevant to condition 8-1(9) and condition 8-2(3) (This figure is a representation of the co-ordinates shown in Schedule 2)



**Figure 1: Malaga to Ellenbrook Rail Works development envelope and disturbance footprint**



**Figure 2: Native vegetation retention areas relevant to condition 8**



**Figure 3: Native vegetation retention area at Patch 1 Malaga relevant to condition 8-1(9) and condition 8-2(3)**

## **Schedule 2**

Coordinates defining the Malaga to Ellenbrook Rail Works development envelope and disturbance footprint in Figure 1 and coordinates defining the Native Vegetation Retention Areas in Figures 2 and 3 are held by the Department of Water and Environmental Regulation, Document Reference Number DWERDT349019.

## Appendix H – Architectural Design Statement



# Ellenbrook Station Architectural - Design Report MEL-MLCX-AR-RPT-00001

<b>Contractor Name</b>	MELconnx				
<b>Contractor Document No.</b>	MEL-MLCX-AR-RPT-00001				
<b>Contractor Revision</b>	A	<b>No. of Pages</b>	136	<b>Contract No.</b>	PTA200001

PTA Revision	Submission Date	Description	Contractor Representative Signature	PTA Representative Signature
A	14/06/2021	Issued for Review	M. Aravind	

Status Information		
Deliverable Review Status	InEight Document Code	Description
<input type="checkbox"/> <b>ACCEPTED</b>	<b>ACC</b>	Acknowledgement by PTA that, following a risk-based review, the deliverable appears to be satisfactory. Acceptance by PTA: 1. Indicates that the deliverable appears to comply with the specified requirements, including applicable standards and legislation; 2. Indicates that the deliverable appears to have been produced in accordance with the relevant engineering assurance processes; and 3. Does not remove or alter any duties or responsibilities placed on a party by the Contract, standards or statutory regulations.
<input type="checkbox"/> <b>ACCEPTED WITH AMENDMENTS (ACCEPTED WITH CLARIFICATION)</b>	<b>ACC-AMD</b>	The design may proceed for the related design works. The design deliverable shall be amended and resubmitted for final acceptance within the time frame specified by PTA in the Review Comment Sheet. This incorporates the EM4P Category 2 – Accepted with Clarification
<input type="checkbox"/> <b>(NOT ACCEPTED) REVISE AND RESUBMIT</b>	<b>REJ-RSB</b>	The deliverable is non-compliant and introduces risk. It requires the reissue of amended documentation, as well as, a written response to the comment. The resubmitted deliverable shall be subject to a further acceptance review as specified by the CPE in order to ensure compliance of the deliverable, and accepted by the PE and CPE.

The related Document **Review Comments Sheet** may be located by clicking the linked documents icon: “  next to the Document No. in the Documents register and scrolling to the Links section at bottom of the Document Record.



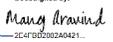
## Morley-Ellenbrook Line

# Architectural & Urban Design Reference Design Report for Ellenbrook Station

MEL-MLCX-AR-RPT-00001

Document Number: MEL-MLCX-AR-RPT-00001  
 Rev: A

METRONET Stage 1: Morley-Ellenbrook Line  
 Architecture and Urban Design Report

Rev	Date	Purpose of Issue	Prepared	Reviewed	Approved
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## 1. Executive Summary

This Reference Design Report has been prepared to present the architectural and urban design for the Ellenbrook Station and precinct.

The Ellenbrook Station and precinct is located within the new Ellenbrook Town Centre near the intersection of Parkway and Transit Way. The station is unique on the Morley Ellenbrook Line as it is the fifth and last station from the Perth CBD and located within a civic environment. A single-storey ground-based building with a clear hierarchy of simple architectural forms. The roof has a saw-tooth geometry and 'floats' above the building providing natural light and cross ventilation. The walls are clad in face brick to reflect local character and materiality.

During the Reference Design stage, the station building underwent functional and spatial planning refinement in coordination with the other disciplines, including structures and building services. The architectural design was further developed, with key elements such as the roof geometry and drainage strategy amended, as well as the elimination of the requirement for box gutters, and a reduction in the extent of skylights.

The overall architectural design and scale considers a holistic approach where the station building forms an integral part of the precinct and the surrounding civic nature of the site, to support and enhance the local character of Ellenbrook Town Centre, while also considering future potential developments around the precinct.

The station is accessed from the north-east via the 'Welcome Place'. The Welcome Place is bound to the north by Park Way and extends in an almost 'U' shape around the station to connect to both the bus interchange and the car park located on either side of the station building. At the outset of the Reference Design stage, the site allocated for future development on the south-east of the Welcome Place was pulled back slightly to open up the Welcome Place towards the car park to improve the AD phase design in terms of sightlines, cyclist and pedestrian movements. Further refinements made during the early stages of Reference Design include swapping the secure parking with the SER and moving the secure parking closer to the station, revision of the parking layout to eliminate the 45-degree bays and one-way vehicle flow, the extension of parking to the south along the rail corridor and the relocation of the BMX track. The Man's Shed and Community Garden were also better considered in terms of access to and around, and their integration into the precinct.

The carpark has been designed holistically within the station precinct and the existing park and sports field. Trees in swales have been incorporated into the carpark design to provide maximum shade amenity while promoting sustainability initiatives.

The urban design considers the station building and the surrounding civic context. The precinct also references the greater surrounding context of the Swan Valley with native trees and planting, designed to be "a station within a park" with the Welcome Place being at the centre connecting everything. The Welcome Place provides a connection to the community and place through the integration of public artwork giving the station a unique and recognisable identity. The addition of public art integrated into the landscape and arbour structures within the Welcome Place also acts as 'attractors' that add interest while also aiding wayfinding. The Welcome Place has been designed with people in mind with seating, shading and 'dwell' areas sensitively located to make visitors feel comfortable and safe.

The Village Common is to the north of the station precinct, across Park Way, and located within the future rail corridor. In consultation with local government authorities, the SDRP and PTA, it was agreed the original requirements for activating this area were to be refined and kept as a low maintenance landscaped space, that follows Ellenbrook landscape guidelines and essentially connects the station precinct to the northern existing PSPs while providing safe and clear sightlines to the station precinct.

The SDRP were presented the initial design thinking at the start of Reference Design stage and as the design progressed the design underwent two SDRP design reviews where comments were given, and a response provided in return by the team. Some of the design suggestions / comments are currently being considered from a cost and design impact point of view for consideration in IDD.

This report details the design progression in more detail through text and diagrams, including design refinements made, functional requirements detailed, and coordinated design solutions and strategies developed to date.

---

**Acknowledgement of Country**

MELconnx acknowledges the Whadjuk People of the Noongar Nation as the Traditional Custodians of the land and waters on which the Morley-Ellenbrook Line Project is located. We pay our respect to their Elders, both past and present and thank them for their continuing connection to the country, culture and community.

## 2. Project overview

### 2.1 METRONET Vision and Objectives

As Perth’s single largest investment in public transport, METRONET will transform the way people commute and connect. It will create jobs and business opportunities and stimulate local communities and economic development to assist communities to thrive. The METRONET vision is for a well-connected Perth with more transport, housing and employment choices.



In delivering METRONET, the WA Government has considered peoples’ requirements for work, living and recreation within future urban centres with a train station at the heart.

The objectives are to:

- Support economic growth with better connected businesses and greater access to jobs
- Deliver infrastructure that promotes easy and accessible travel and lifestyle options
- Create communities that have a sense of belonging and support Perth’s growth and prosperity
- Plan for Perth’s future growth by making the best use of our resources and funding
- Lead a cultural shift in the way government, private sector and industry work together to achieve integrated land use and transport solutions for the future of Perth.

### 2.2 Morley-Ellenbrook Line overview

As Perth grows, so does the need for rail infrastructure and METRONET is a critical element of the State Government’s infrastructure agenda. The Morley-Ellenbrook Line (MEL) Project will improve connectivity between the north east metropolitan area and the rest of the city and unlock economic development in these local community areas.

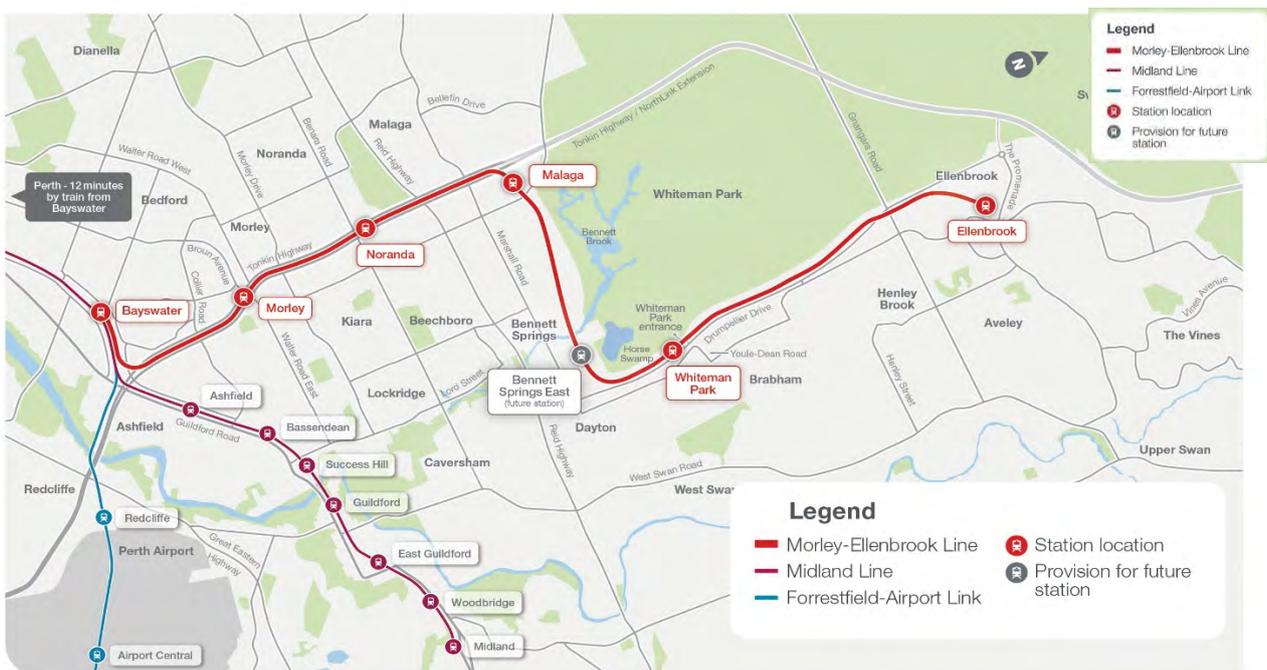


Figure 1: Morley-Ellenbrook Line © METRONET

The Public Transport Authority (PTA) is the lead agency delivering the MEL Project, with Main Roads WA (MRWA) undertaking some enabling works.

### 2.2.1 Project features

Transport infrastructure works for the Project include:

- A 21km rail line spurring from the Midland Line east of Bayswater Station, travelling north in the Tonkin Highway median, east through land north of Marshall Road and north on the western side of New Lord Street into Ellenbrook
- Stations at Morley, Noranda, Malaga, Whiteman Park and Ellenbrook with future-proofing for a station at Bennett Springs East
- Parking and bus interchanges/facilities at stations
- Significant grade separations at key road crossings
- Underpasses to allow the rail line to enter and exit the Tonkin Highway median
- Principal shared paths for walking and cycling access along the rail line
- Track and associated infrastructure to connect to the existing Midland Line
- Road and bridge reconfiguration works
- Integration across the packages of works and other nearby projects.

### 2.2.2 General scope of works

The Project's general scope of works includes the design and delivery of rail infrastructure and ancillary works to support operational passenger rail between Bayswater and Ellenbrook, including stations with inter-modal bus and rail with parking and associated road works at Bayswater, Morley, Noranda, Malaga, Whiteman Park and Ellenbrook stations.

The Project activities include all investigation, design, approvals, construction, testing and commissioning, Entry Into Service (EIS), training and operational readiness required to incorporate the new railway to Ellenbrook, and tie into the existing network including the associated road, utilities and other required works to interface with adjacent works and contracts. This will include bulk earthworks and retaining, structures, grade separations, roads and drainage.

The design and delivery of the main works package for the Project is broken into three distinct stages:

- Alliance Development Stage
- Project Alliance Reference Design Stage
- Project Alliance Delivery Stage (Detailed Design through to Project close-out).



Figure 2: Architect's Impression of Ellenbrook Station © MELconnx

### 2.2.3 Key Project Objectives, Key Compliance Objectives and Critical Success Factors

The PTA and MELconnx’s single Non-Owner Participant (NOP) Laing O’Rourke Construction Australia Pty Ltd, have formed an integrated, collaborative Project Alliance to successfully deliver rail infrastructure that reflects our absolute commitment to achieving the Project Objectives and delivering positive outcomes for the State.

The following image demonstrates how we have mapped each Key Project Objective in the Project Alliance Agreement (PAA) against the Critical Success Factors to achieve best-for-project outcomes, underpinned by the Key Compliance Objectives.

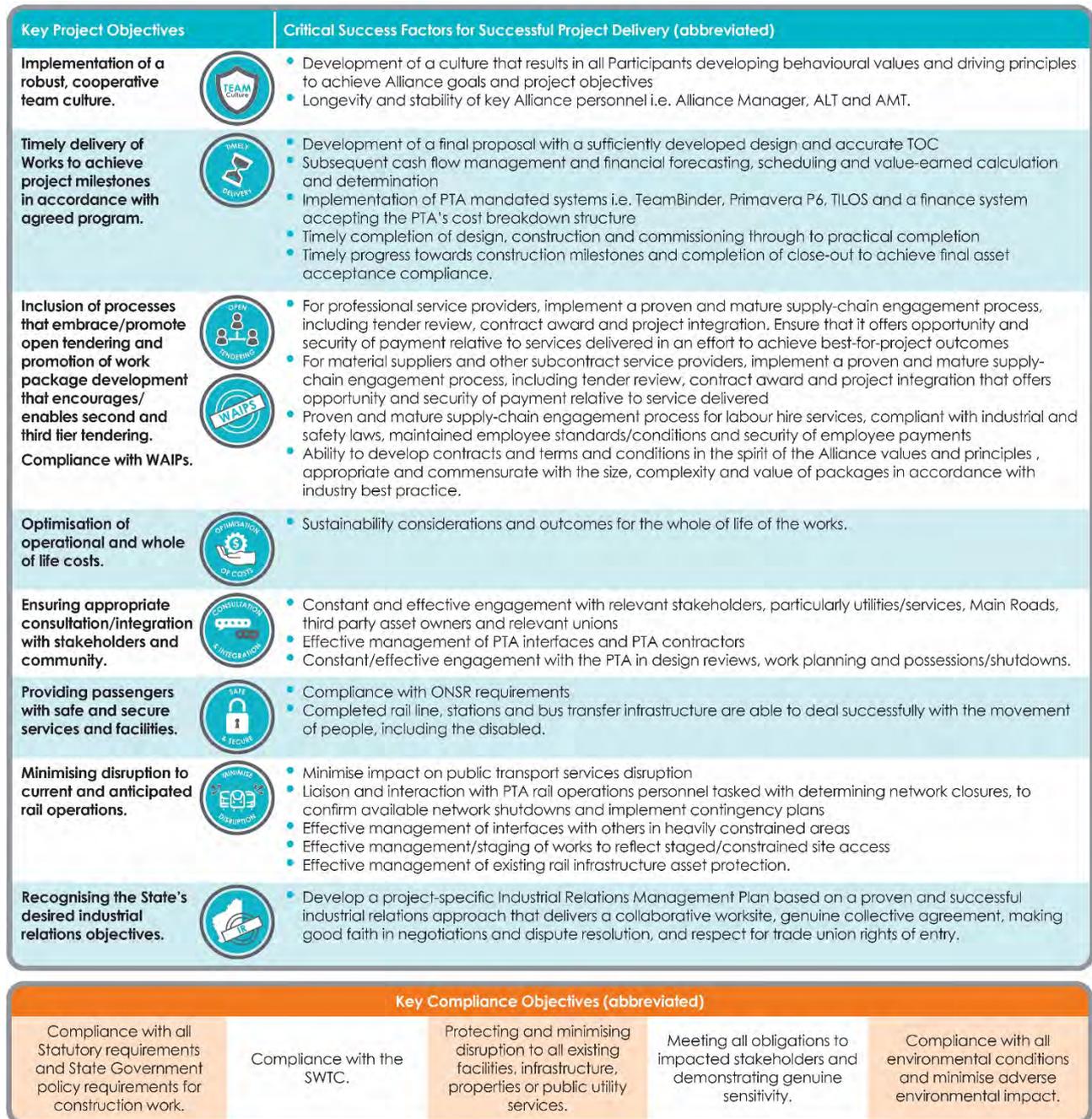


Figure 3: Key Project Objectives, Critical Success Factors and Key Compliance Objectives



## 2.4 Purpose of the Report

This design report has been prepared to present the architectural and urban design for the Ellenbrook Station and precinct at Reference Design stage.

The report details the design progression carried out following the AD stage design submission, to include design refinements, coordinated design solutions with other work packages and developed strategies. All refinements have been summarised through text and diagrams to clearly articulate the progression and how these have been integrated into the overall architectural and landscape design solutions.

The report also identifies design interdependencies with other design packages, the relationship between each of the Package(s) engineering lifecycle and the assurance gates throughout the Project.

This design report and the associated architectural and landscape drawings are intended to be reviewed together.

## 2.5 Changes Since Previous Design Submission

### 2.5.1 Alliance Development Stage to Reference Design Stage

The following key design changes have occurred during the Reference Design development:

- General concourse planning refined and optimised to include building services requirements
- Skylight width reduced and optimised
- Roof to accommodation modules - changed to mono-pitched with eaves gutters
- Northern entrance deleted & kiosk incorporated into the entrance circulation space
- Kiosk increased in size
- Bike shelter requirements split into 2 separate shelters (no increase in size)
- Canopy designs optimised
- Bus interchange accommodation – Electrical and Mechanical room added and other service rooms amended to follow SWTC requirements
- Secure parking brought closer to the station (swapped with SER)
- Arbour structure added to precinct
- Parking layout revised to eliminate 45-degree bays and one way vehicle flow
- Welcome Place has been refined with additional garden beds, trees, raised lawn and seating walls. In addition, the area of the Welcome Place has increased with the boundary of the future development site moving further east.
- Work on the design of the Village Common has progressed based on discussions with PTA, SDRP, City of Swan and LWP.
- Carpark has been reconfigured, optimised, and has expanded further south.

### 2.5.2 Reference Design to Interim Detailed Design

The following design changes have occurred during the Interim Detailed Design development;

Not applicable

### 2.5.3 Interim Detailed Design to Final Detailed Design

The following design changes have occurred during the Final Detailed Design development;

Not applicable

---

### 2.5.4 IFC Design Finalisation

The following design changes have occurred during the IFC Design finalisation;  
Not applicable

## 3. Design Description

### 3.1 Scope of this Design Package

The Ellenbrook Station and precinct is located within the new Ellenbrook Town Centre near the intersection of Parkway and Transit Way and features an at-grade island platform and station entry building.

In accordance with the SWTC, the scope of works for the Ellenbrook Station and precinct includes the station building, platforms, the bus interchange, the associated single level car parks, access roads and paths / pedestrian shared paths, station surrounds, including the landscaping and associated facilities, ancillary buildings, SER, and Western Power sub-station.

The following scope outline diagram outlines the scope for this design package:



Figure 6: MELconnx Limit of Works Diagram

### 3.2 Design Description / Overview

The basis of the design and the specific design methodology adopted is described below.

#### Station Architecture

The site of Ellenbrook Station is located near the intersection of The Parkway and Transit Way and will form part of the future new Town Centre of Ellenbrook. The new station precinct aligns with the existing Town Centre street grid and current networks.

The architectural design considers a holistic approach where the station building forms an integral part of the precinct and the surrounding context to support and enhance the local character of the Ellenbrook Town Centre including any future potential developments.

The approach to design has considered the project's functional requirements, the need to deliver a sustainable, efficient and cost-effective design, and the desire to create a built environment that is sensitive to the local culture and environment. Of significance, is the consideration of how people will experience the station and the associated precinct in their day-to-day lives.

The Ellenbrook station is unique on the Morley Ellenbrook Line as it is the fifth station from the Perth CBD or 'start of the line station' located within a civic environment. The design features a single-storey, ground-based building with a clear hierarchy of simple architectural forms. The Station building being the highest, then the services and then the canopies, each element scaled down to reflect the hierarchy. The roof has a saw-tooth geometry and 'floats' above the building providing natural light and cross ventilation. The walls are clad in face brick to reflect local character and materiality. There is a clear legibility to the design, with a strong axis into and through the station and a welcoming entrance that feels open and connected to the station precinct.



Figure 7: Artist's Impression of MELconnx Station Architecture

## Precinct Urban Design

The precinct urban design is separated into distinct yet interconnecting areas, consisting of the Welcome Place, Village Common and the Carpark, all of which respond specifically to the surrounds and character of Ellenbrook.

The Welcome Place has a rectilinear layout that reflects the layout and streets of Ellenbrook, serving a functional purpose of providing clear and direct pedestrian routes through the space and to adjacent sites. The elements and materials of the Welcome Place is congruous with Ellenbrook as a whole, including arbours, expansive lawn, brick seating walls, hardy planting and sculptural elements.

The Village Common is a temporary space intended for future development. The proposed design provides a low maintenance landscape with clear sightlines and a strong connection to adjacent pathways including the existing PSP.

The carpark is considered holistically within the station precinct and surrounding urban fabric, the existing park and future planned developments. Significant number of trees in swales have been incorporated into the carpark design to provide maximum shade amenity while promoting sustainability initiatives.



Figure 8: Artist's Impression of MELconnx Station Urban Design

### 3.3 Design Principles

MELconnx have referenced the 10 Principles of Good Design, outlined under, 'State Planning policy 7.0 Design of the Built Environment,' to develop an appropriate design response and sense of place for the station and precinct design.

- Context & Character - including distinctive characteristics, prominent natural and built features, local civic gestures and distinctiveness, intended future character and civic identity
- Landscape Quality – The qualities of Ellenbrook have been reflected in the landscape design ensuring an identity to Place, including the use of materials, arbour structures, planting, artwork, rectilinear layout, and a strong civic quality.
- Built Form & Scale – a unique identity, response to landforms and existing built fabric, coherent local identity, articulation of built forms
- Functionality & Build Quality - quality robust materials, flexible and adaptable spaces, future proofing, station functionality and serviceability/maintainability & integrated services
- Sustainability – the principles of the Metronet sustainability strategy have been incorporated in the design, including social sustainability by providing connectivity, amenity, resilience and adaptability. It is also a sensitively designed environment that considers biodiversity, water and the local climatic conditions providing optimal shading and natural vegetation.
- Amenity – spaces have been designed to be welcoming and comfortable, universally accessible with good levels of natural daylight and natural ventilation
- Legibility - The station building is the central identifiable element with clear sightlines from all modes of transport to and from the building. There is a clear hierarchy of architectural elements from the larger station building to lower canopies that assist wayfinding and provide identifiable elements. Landmark structures within the Welcome Place such as public art and arbour structures provide further legibility to the station entrance and forecourt. This is further enforced by clear pedestrian and cycling connectivity to wider networks, with path connections focusing on desire lines.
- Safety - the fundamentals of CPTED have been integrated into the design, including lighting, clear sightlines, clear ownership and boundaries, elimination of entrapment spots, elimination of movement predictors, legible wayfinding, landscaping, and activation.

- Community - the Ellenbrook Station, Welcome Place and Village Common have been designed as an important connection and outset to surrounding open spaces, sporting amenities, educational facilities, and retail.
- Aesthetics – the design aims to be an attractive and welcoming station and precinct that is unique to Ellenbrook. Public art, aboriginal culture, local materiality and local elements integrated into the architecture and landscape giving it a clear sense of place and character.

### 3.4 Context, Character and Function of the Station

#### Line-wide Context

‘City to Suburbs’, where ‘Rail meets Landscape’

The design approach for the Morley-Ellenbrook Line is to create a family of buildings tied together through common design language to establish a line-wide identity. The approach is to have a degree of commonality between the five stations, however, also allow the stations to have unique elements to convey their own local identity and speak to the community in which they reside. Ellenbrook station is at ground level, Malaga and Whiteman Park are elevated and Morley and Noranda stations are on a highway, meaning they are all part of a line wide narrative but also have their own identity and unique elements. A ‘kit-of-parts’ approach has been taken to identify standardisation of components (where appropriate) to maximise efficiency of construction and maintain similar elements that informed a common language across all stations. Thus, Ellenbrook Station shares line-wide consistencies with the other stations on the Morley-Ellenbrook Line in terms of simple roof geometries, materiality, geometric form, kit of parts assembly and modular designs.

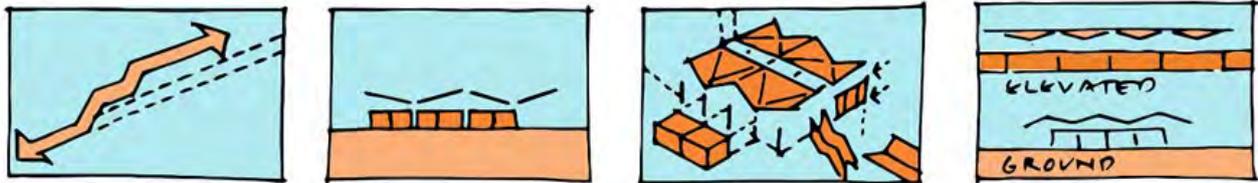


Figure 9: Rail Transition, Modular, Kit of Parts, Common Identity

In keeping with the line-wide design narrative identified in the AD phase key ideas have been developed in further detail in the Reference Design for this station.

#### Site Context

The Ellenbrook Station and precinct is located within the residential suburb of Ellenbrook and the new Ellenbrook Town Centre. The site of Ellenbrook Station is located adjacent the potential future rail alignment extension, near the intersection of The Parkway and Transit Way. The design of the new precinct aligns with the existing town centre street grid and current networks. The Parkway serves as a future secondary main street in the broader Ellenbrook development, and correspondingly extends a formal, urbane character streetscape into this area in anticipation of future development that will consolidate the broader town centre experience for future residents and visitors.



Figure 10: Ellenbrook Station Precinct Extent and Context

### Station Specific Character and Context

Whilst the kit of parts allows a degree of rationalisation of construction, each station, such as Ellenbrook Station, remains an individual building with its own identity reflecting the local site conditions and topography. It was neither practical nor desirable to create a series of identical structures along the length of the line.

Ellenbrook is unique to its sister stations in its material quality and 'at ground' features. Ellenbrook Station is the only station to be single storey and at grade, and these are defining features of its character. Its distinctive architectural configuration enables flow between accommodation and access areas. Low-lying planting continuing through the station accommodation zone contributes to the feeling of its 'at grade character,' and encourages a strong relationship with the surrounding environment, "bringing the outside in." In essence, the design is grounded with continuity between public realm precinct spaces and the station platform.

The character of the building is civic in nature. The architecture relates to surrounding civil buildings such as the Ellenbrook Senior College and The Ellenbrook Library, being appropriate in its scale and address to the street. The splaying, gestural form of the station invites visitors into the space beneath the roof geometry, where they may feel welcomed and invited alongside public artwork and considered landscaping. The architecture of the station seeks to compliment the built form and aesthetic of the Ellenbrook town centre and form a part of the streetscape of "The Parkway." Despite being a great civic and communal gesture, the design is also characterised by homely and recognisable elements, found in the materiality and planting selection. Ellenbrook Station "welcomes people" at either the start or end of their journey, as it has been designed to reflect the urban setting of the town centre that the station is located within.

The design is especially functional and process-driven in the way that the design underpins the principles of the Scope of Work and Technical Criteria. The functionality of the station has resulted in an appropriate choice of materials and level of 'buildability,' consistent with the line-wide programme.

## Sense of Place and User Experience

MELconnx sets out to deliver Ellenbrook station precinct as a place that feels occupied and 'owned' by the community it services. This requires a sense of place with an authentic character that reflects its context and the local community's aspirations, making the place cared for, safer and activated. The station has a strong civic presence and scale, all the while set in a friendly and inviting landscape precinct. Upon entering or leaving the station, one embarks upon "a journey through the landscape."

At the forefront of the user experience is delivering better connections and ease of travel. The ease of travel experience through the whole passenger journey, from door-to-door, determines the overall public transport experience. MELConnx seeks to ensure people are provided with a sense of freedom and elevated self-sufficiency in their journey with PTA on the Morley-Ellenbrook Line.

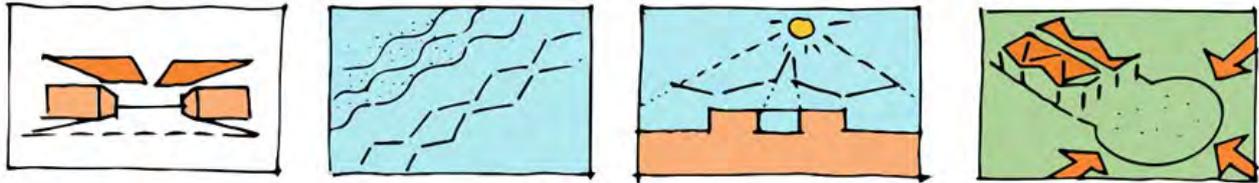


Figure 11: Hierarchy of Form, Natural Patterns, Natural Light, Community Hub

## Sense of Identity

The station is distinctive and of its location. The built form conveys a great sense of unique identity through its material quality and 'at ground' features. Ellenbrook Station is the only single storey station on the line. The design facilitates visitors in an accessible and generous way, inviting them into the station and concourse area, enabling ease of flow between accommodation and out to the platform. Although civic in nature, the architecture is grounded with continuity between the Welcome Place, Concourse and the station platform.

The site will become the heart of the town, and there is an opportunity to intensify density and create community around the station/park precinct to assist Ellenbrook Station in achieving this presence. The built form and scale of the station creates this sense of identity, ensuring its influence in years to come.

Some of the unique material elements of the Ellenbrook Station, such as face brick, roof colour, patterns and geometric form is reminiscent of the surrounding urban civic gestures and the local residential identity. Colours of terracotta, evident on roofs throughout Ellenbrook have informed the colour palette. Pine trees of the area inform the light toned roof soffits. Moreover, triangulated geometries, folded roof canopies and brickwork reflect the suburban roof profiles and character of Ellenbrook residences. Together, these material elements informed by the site narrative, endeavour to create an inviting, detailed development that feels homely and comfortable.

The public art strategy further aims to provide an "attractor" piece to the Welcome Place. An art piece that is unique to Ellenbrook, giving it a unique identity and draws people into the precinct and station.

Gnarla Biddi is a METRONET policy which recognises and acknowledges the significance of Country to Aboriginal people. The programme encourages METRONET delivery teams to realise opportunities for Aboriginal people to play their part in a major city building project – and for design teams to work with Noongar people to recognise and celebrate Aboriginal culture, stories, and achievement. We wish to acknowledge the traditional custodians of the land where the Ellenbrook station is situated on. We acknowledge that this location is on Whadjuk Noongar land and pay our respects to the strength, resilience, and capacity of the broader Noongar nation.

MELCONNx is exploring ways by which the Ellenbrook station can acknowledge and celebrate Country and language by integrating site specific experiences and spatial sequences relevant to the recognition of place and unique identity.

Ellenbrook Station aligns with the line-wide narrative and material palette with the use of the angled roof geometry, timber-look soffits and a fritted glass skylight spine running through the centreline of the station. These material elements aid in the visualisation of a line-wide approach and convey congruity on one's journey to or from Ellenbrook.

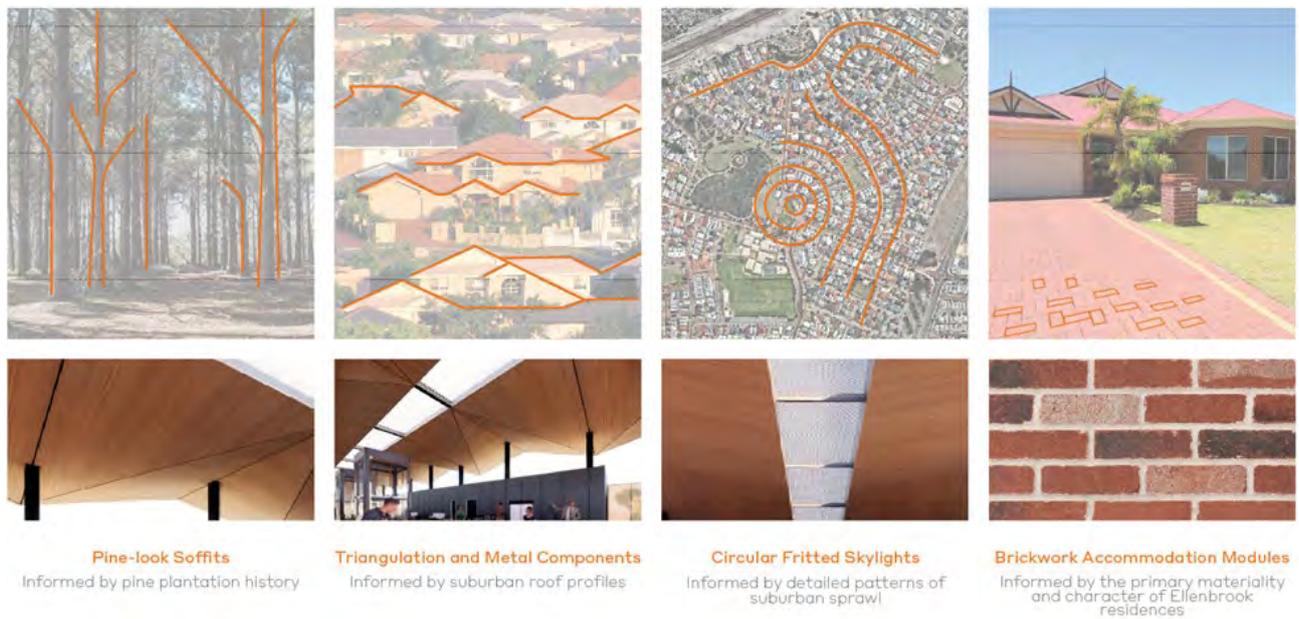


Figure 12: Ellenbrook Station Material Palette is reminiscent of the surrounding urban and residential identity

### Station Operational and Functional Design

The proposed design solution for Ellenbrook Station is consistent with the functional and performance requirements of the SWTC.



Figure 13: Ellenbrook Precinct Masterplan

The site of Ellenbrook Station is located adjacent the potential future rail alignment extension, near the intersection of The Parkway and Transit Way. For functional purposes, the design of the new precinct aligns with the existing town centre street grid and current networks. At Ellenbrook Station, a generous, accessible, and leafy forecourt fronts “The Parkway,” to welcome visitors into The Station Entry Building. This forecourt seeks to connect the five key modes of transport / access: the train station itself, the Bus Interchange to the north-west of the station, pedestrian/cycle movement to the site, and movement from car bays and the Kiss n’ Ride drop off to the south of the station. For the individual vehicular transport modes to operate efficiently they have separate vehicular access, however, are all within close walking distance from each other and the station, connected via the centralised forecourt (Welcome Place).

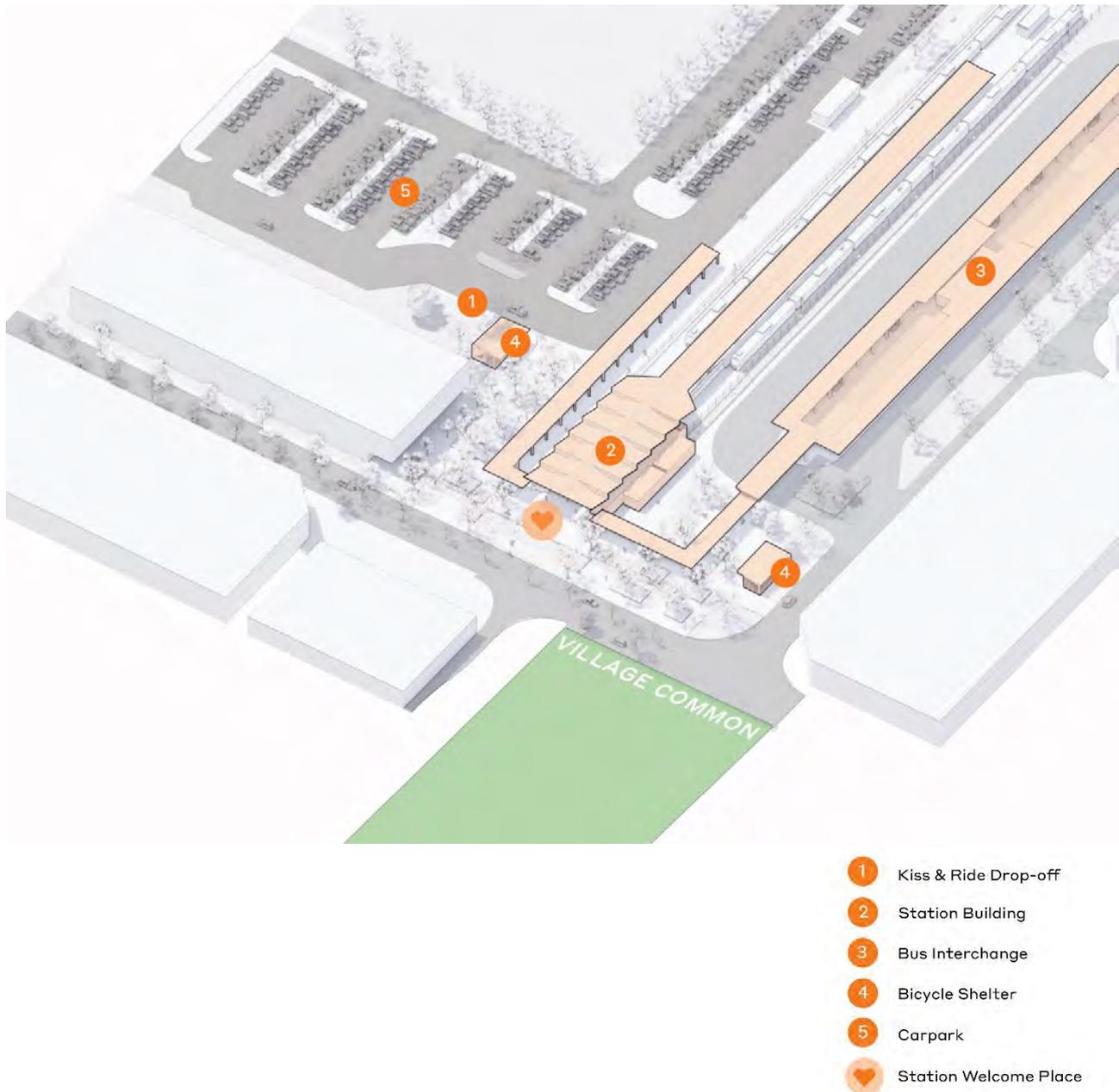


Figure 14: Ellenbrook Station Precinct Diagram

### The Welcome Place

The Welcome Place is the forecourt or 'community hub' of the station and is the place where people first experience the Town Centre of Ellenbrook after disembarking from the train. Of great importance, the Welcome Place articulates the community's sense of pride. It is also the place where people converge and make decisions on transferring to the various modes of transport and/or connects to surrounding business, retail and F&B outlets, amongst other functions. The design of the Welcome Place is seamlessly and intuitively connected via strong axis and shade canopies to the various modes of transport including bus, vehicle, bicycle and pedestrian pathways while also being nestled into a landscaped park that is both aesthetically and functionally welcoming.

At Ellenbrook Station the Welcome Place is an inviting and safe space with seating, lawn, shade, wayfinding paths, canopies and secure bicycle parking. Lawn in the station welcome place creates a natural and informal meeting place for locals and visitors to dwell and connects the welcome place to the surrounding park and sports fields.

Providing for safe, legible and comfortable access to and through the station and precinct is a key design consideration. Well-lit spaces with clear and intuitive wayfinding means there is no searching for where you need

to go to, but a space that provides intuitive clues before relying on signage. The station building is a visible and prominent feature on the site visible from all angles within the precinct. Cycle paths have been designed as direct routes and cycle parking facilities have been integrated close to the station entry to accommodate the various traffic flows coming from various networks and ensuring they are visible from the station.



Figure 15: Ellenbrook Station Welcome Place



Figure 16: Ellenbrook Station Welcome Place – Birds Eye View

## The Concourse

Upon entering the Station Building, visitors and staff will find accommodation units organised around a central pedestrian circulation foyer that provides access between the unpaid zone and the at-grade platform paid zone. For operational purposes, the unpaid concourse area includes public service facilities, Kiosk and associated Stores. Accommodation wings are located on either side of the circulation zone, for efficiency of staff movement and access. The Station concourse is protected by the floating main canopy to provide a well-illuminated, generous space that is naturally lit and ventilated. The placing of all furniture, including lights and signage poles, does not intrude into pedestrian pathways. There is a minimum obstacle-free width consistent with the footpath before and after concourse furniture.

The unpaid concourse area includes public service facilities (automatic teller machine, vending machines and pay phone), passenger ticketing/information facilities (CIDs, PSP with LCR and TVMs, information modules and help phones), station administration/office facilities (CSO), Fire indicator panel, Third Party and localised services cupboards, kiosk and associated Stores. Furthermore, the design sees that AFGs are located immediately adjacent to the concourse CSO. These provide access control to the paid concourse area of the station. Past the faregate line, the paid concourse area has public toilet facilities, inclusive of male toilet, female toilet and unisex accessible toilet, staff amenity facilities (crib room, toilet facilities and staff changing areas) and station storage/cleaning facilities (Cleaners room and Store room).

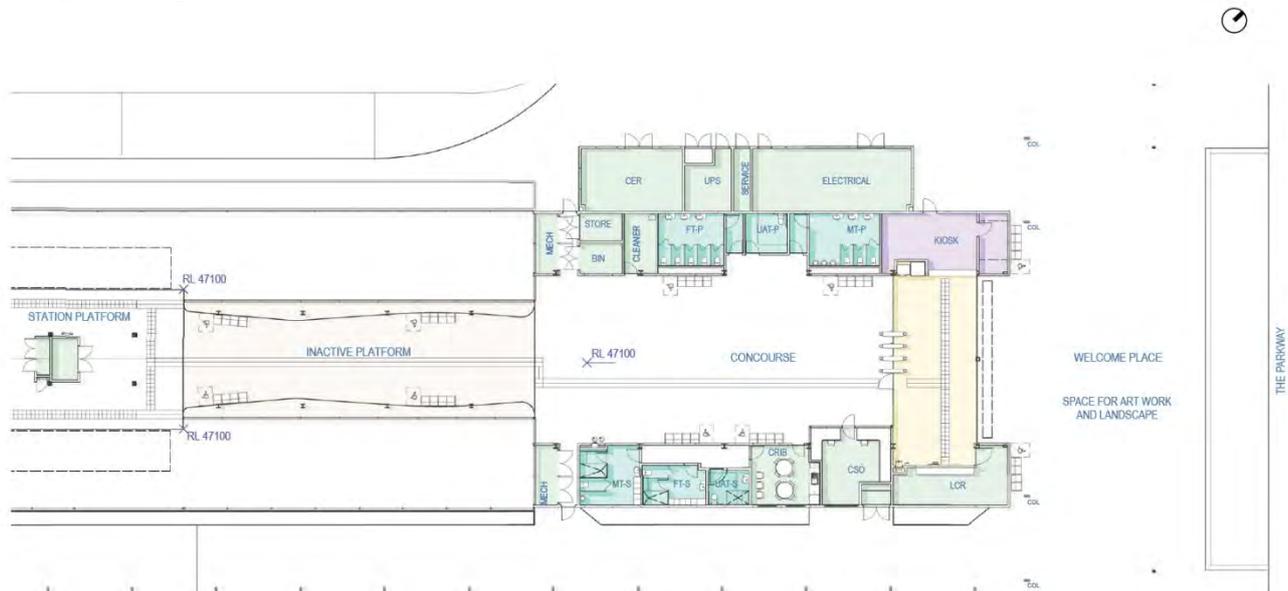


Figure 17: Ellenbrook Station Concourse Plan

## The Platform

The train station platform is an island platform 10m wide by 150m long and is designed to allow the operation of six car B and C series rail cars providing access to train services to and from Perth. In addition to the operational portion of the platform there is a non-operational section that allows for a sliding buffer stop of 25m long (min requirement is 25m).

The non-operational platform is 100% under cover while the operational platform has more than 75% canopy cover providing weather protection. The platform also includes passenger safe zones with dedicated PTA standard stainless seating and wheelchair waiting areas with weather / wind shelters and visibility of passenger information facilities (PIDs and PSMs). Staff amenity facilities (driver's toilet and tea prep), station storage and station operational facilities (Communications rooms, electrical rooms, and mechanical plant rooms, GSS storage rooms) and Staff Office are located within the platform accommodation area.

As the Ellenbrook is 'The Start / End of the Line' station, the current station design does not allow train traffic flow beyond the station to the north-east. The platform meets the station concourse and is the onboarding/offboarding point of the line.

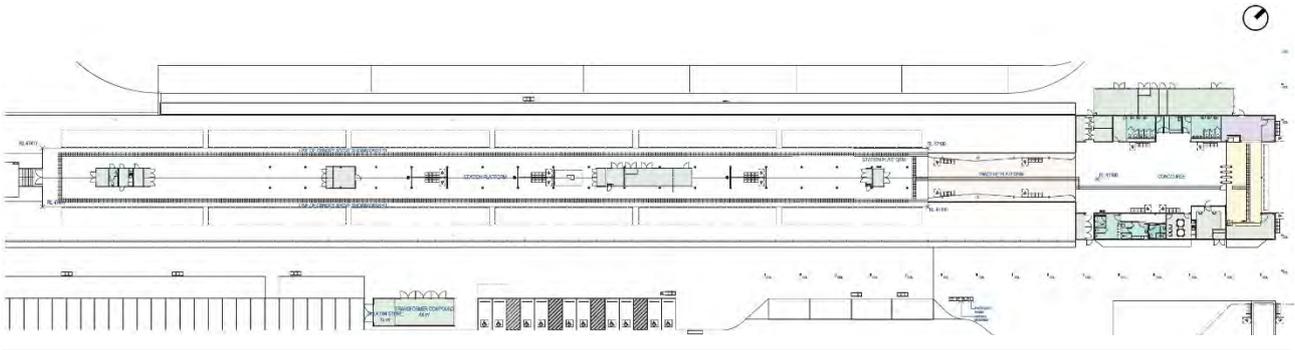


Figure 18: Ellenbrook Station Platform Plan

### Bus Interchange

Ellenbrook station is a bus/railway interchange and therefore the precinct includes an at-grade bus interchange. The bus interchange is a one-way (anti-clockwise) interchange accessed off The Parkway and runs parallel to the rail corridor positioned to have clear sight lines to the train station and the Welcome Place. Buses circulate between active stands and layover bays within the station precinct, rather than relying on utilising the surrounding road and future road networks, facilitating traffic flow management, and ensuring minimised traffic build-up around the site.

All bus stands are protected with canopy shelters. This continuous cover intends to provide a high level of passenger comfort and protection from the elements. The continuous bus canopy shelters create continuous weather protection to patrons boarding and alighting bus services at each stand and whilst navigating to the Station Entry Building. The bus interchange does not impede on the Welcome Place immediately in front of the station entry.

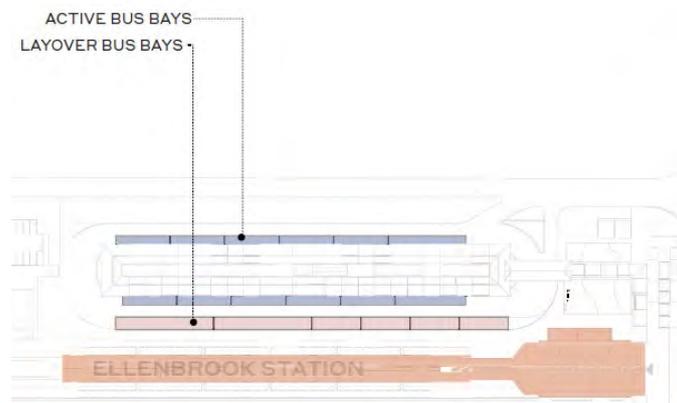


Figure 19: Bus Interchange Diagram



Figure 20: View from the Bus Interchange

The bus interchange facilities include seating, with weather protection screening at each bus stand, and passenger information modules. The design also includes Public Toilets, and dedicated bus driver facilities, Crib Room and Toilets located within the central island of the bus interchange.

The central median layout of the bus interchange means that pedestrians can move between either side of the bus interchange without impeding on traffic flow or endangering themselves. A pedestrian priority crossing has been positioned to facilitate pedestrian priority access between bus stands and the station.

The following table summarises the size of the bus stands provided at Ellenbrook station:

	LENGTH			TOTAL
	20m Long	26m Long	36m Long	
Active - Standard	10			10
Active - Articulated		2		2
<b>Active Total</b>				<b>12</b>
Layover - Standard	4			4
Layover - Articulated			2	2
<b>Layover Total</b>				<b>6</b>

A dedicated DFES hardstand has been located with access to the booster pumps as highlighted in the below diagram.

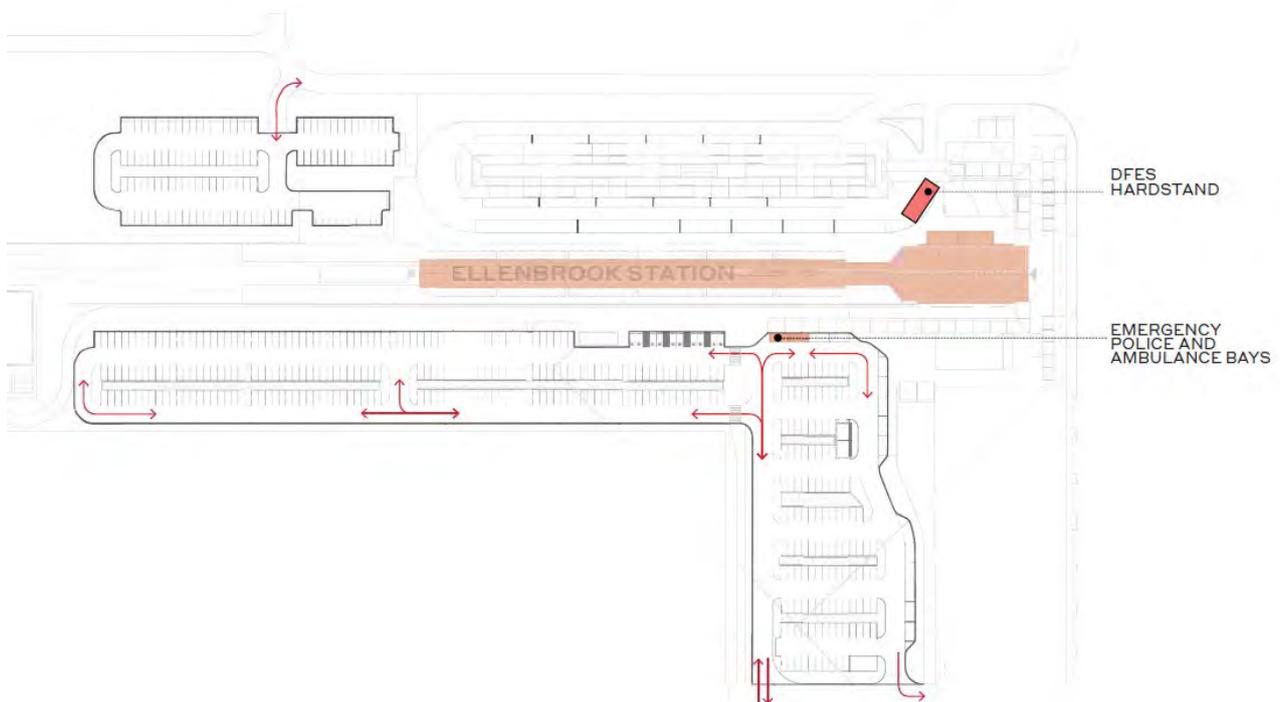


Figure 21: Emergency Vehicle Bays Diagram (Ambulance and State Transit Police Vehicles)

### Station Carpark Facilities

Ellenbrook Station features two carpark facilities, one to the north-west of the rail reserve and one to the south-west of the station and rail reserve. Vehicle access to all parking facilities and drop-off areas in the larger southern

Carpark is directly from Civic Terrace. The smaller carpark to the north-west is accessible off Cussington Way, which runs parallel to the rail line. Carparking bays at Ellenbrook accommodate a total of 509 general car parking spaces (minimum requirement is 500 bays), with 386 bays located to the south-west immediately adjacent to the park and 123 bays to the north-west. Of the 123 bays, 10 are secure (fenced off) staff bays. On the south-east the design sees the inclusion of 4 dedicated staff bays, provision for 2 future electric car charging bays, 450 all day car parking bays, 26 short term and set down parking bays and 2 service bays (emergency police and ambulance and bays).

For passenger comfort, bays are no more than 400m walking distance from the station fare gate line. Carparking provisions account for further expansion, with potential for the north-western carpark to extend all the way to the SER building. A total of 10 covered motorcycle bays have been accounted for in the long-term carpark and are as close as possible to the station.

The use of landscaped swales within the car park provides improved WSUD resulting in less underground infrastructure and enhanced future tree canopy coverage / shading (as trees have better rootzones to support tree health and growth) to mitigate urban heat island impacts. The swales also support increased biodiversity outcomes as optimised garden bed sizes support more diverse planting schemes that can respond to Wildflower Capital initiative and 'six seasons' planting schemes – in turn supporting a precinct-wide approach to cultural engagement and Gnarla Biddi.

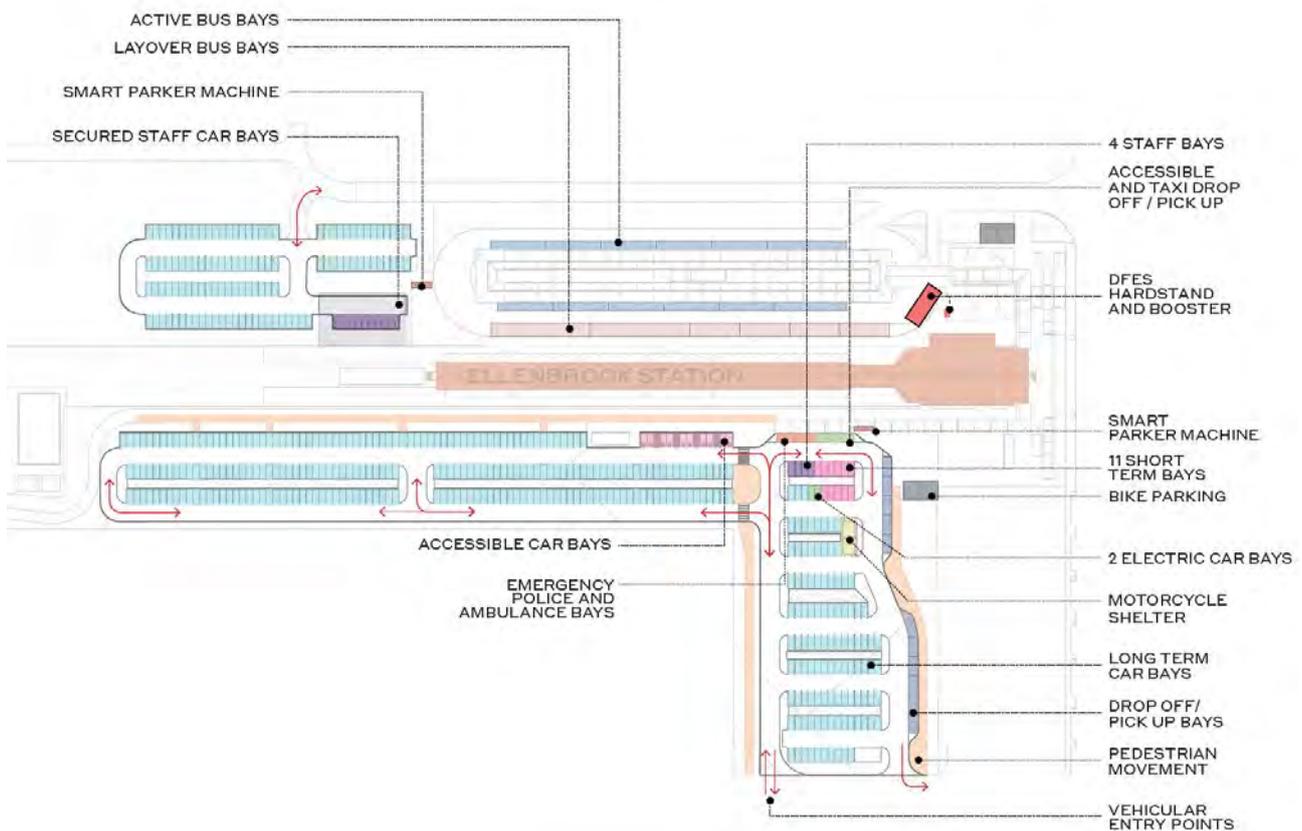


Figure 22: Ellenbrook Station Carpark Facilities

### The Kiss n' Ride

The Kiss n' Ride drop-off facility is located within the south eastern carpark, near the station entrance, providing a cohesive interface with the future development of the town centre. There are 15 Drop-off bays located adjacent to the pedestrian paths. Of these, 2 bays are specially dedicated to accessible drop-off and taxi and they are provided with weather protection and seating areas. Another 11 bays within the carpark configuration will be used as drop-off and short-term bays depending on the requirements.

The Kiss n' Ride free-standing shelter canopies account for a covered walkway traversing the drop-off and linking to the station entrance. The surrounding landscape design incorporates retaining walls, seating walls, and low-

lying planting zones. Lighting poles and surveillance cameras enhance the safety of the area.

### Bike Shelters and PSP

Pathways from all existing and anticipated future pedestrian and cycle pathways in the local area have been considered. For pedestrians and cyclists arriving from the north east, (along the future rail corridor), a PSP connection has been provided through the Village Common providing a strong connection for cyclists and pedestrians coming to and from the Welcome Place from the north east.

A new PSP connection has been provided to the south east to connect to the existing path along Verdant Vista. The new PSP goes around the existing Community Garden and the Man's Shed to run parallel with the rail corridor and connect to the Welcome Place.



Figure 23: Ellenbrook Precinct and PSP Overlay

The required bike shelter provisions have been split into two separate secure bicycle shelters that are located on either side of the Welcome Place to respond to the two connections and minimise crossovers with pedestrians within the Welcome Place as far as possible. Both shelters are located within 100m of the station entry. 10 Stainless open U-Rail bicycle parking provisions have been integrated close to the station entry, within the Welcome Place.

The secure bicycle shelters provide spatial requirements for 128 bike spaces (minimum 99 bikes) and feature double decker storage system, door access control and CCTV coverage. Each of the two bike shelters is to install full coverage CCTV, so that inside the shelter and the entry and exit may be surveyed. Additionally, each bike shelter includes BAS controlled entrance doors, help points and alarm systems for safety and security measures. There is the potential to extend the proposed southern shelter further south following future expansion.

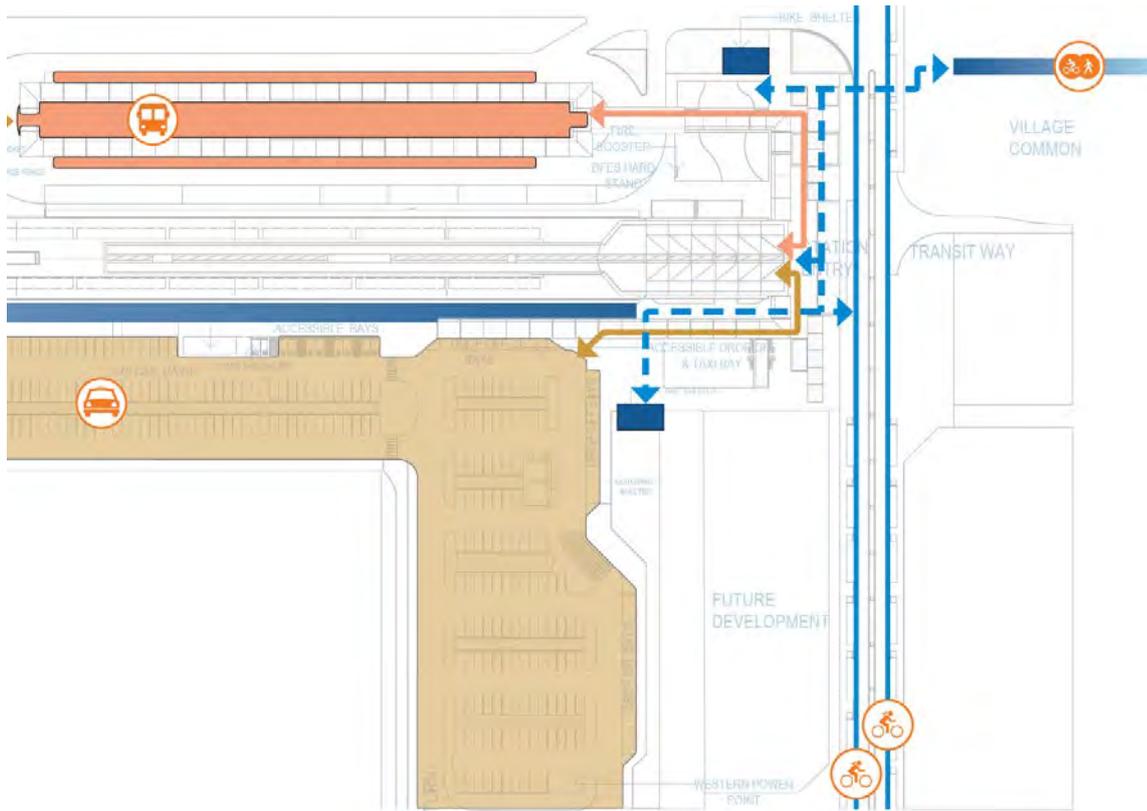


Figure 24: Ellenbrook Bike Shelter Locations

### Ancillary Buildings

Ancillary buildings include the SER, driver facilities and toilets, Bulk Bin Store, Bike Shelters, Transformer compound and Western Power substation as located in the following diagram:

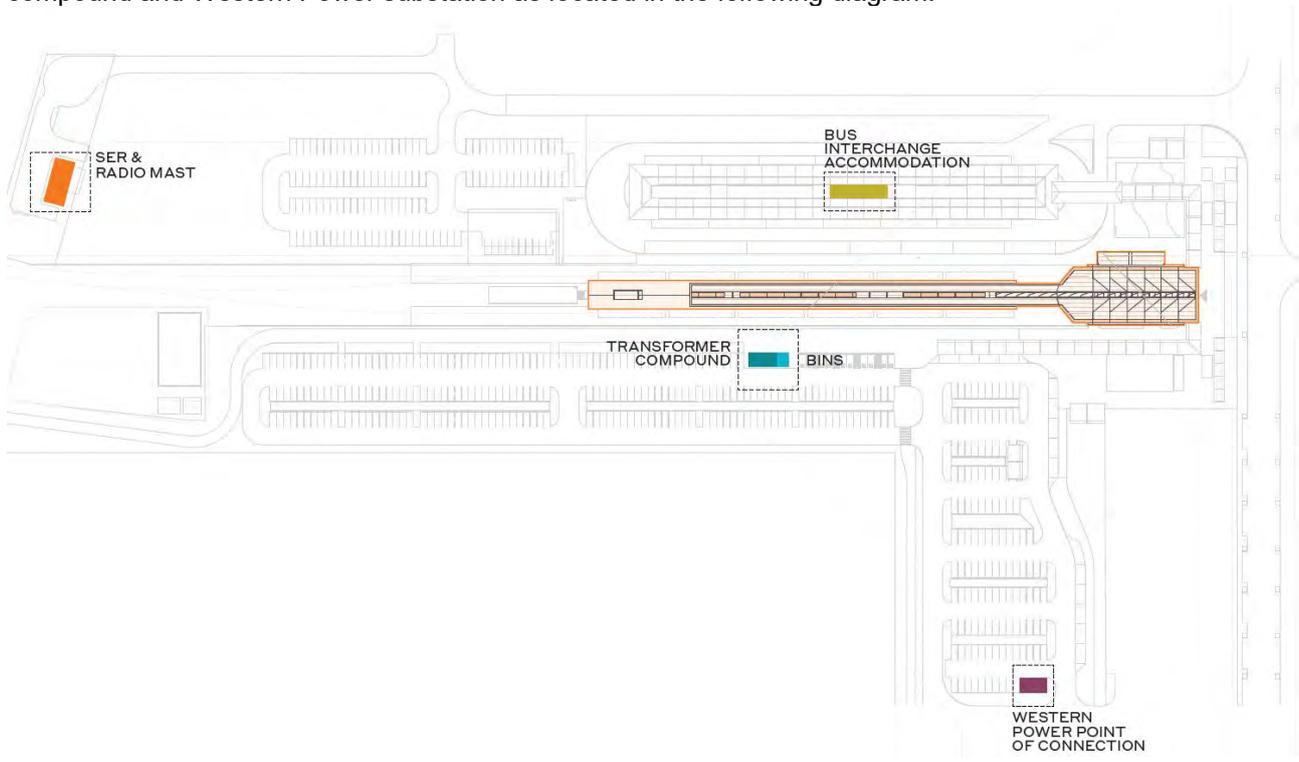


Figure 25: Ellenbrook Precinct Ancillary Buildings

In general, the design of the ancillary buildings follows a line wide and 'kit of parts' approach, and where appropriate, the materiality and architecture align with the station building design. The aim is to sensitively integrate the ancillary buildings into the precincts and station surrounds by carefully locating the structures and minimise visual bulk and scale as far as possible. Where required, and as determined by the Acoustic consultant, acoustic insulation will be integrated into the envelope of the ancillary buildings.

A fully enclosed rubbish storage area in the form of the Bulk Bin Store is located within the south-west car park, accessed from the car park and has walls constructed of rendered brick masonry and secure gate. The Bulk Bin Store has a hose cock on the wall and drainage gully connected to an in-ground drainage system. The location and design of the Bin Store takes into consideration sightlines within the precinct and maintains vehicle setback sightlines. The risk of refuse removal interfering with peak hour traffic times has been considered and determined to be low risk.

The SER (Signaling and communication equipment room) is in the immediate station surrounds, in the north-western corner of the site and is serviced via an access road off Cussington Way. The SER is a building within a fenced compound, with 2 carparking spaces and area and provision for a 10-tonne truck to access the SER including turning space to maneuver.

The PTA Electrical Isolation Transformer Compound is adjacent to the Bulk Bin Store. It is 30sqm in size and located ~~either at least~~ 130m away from the Western Power Point of Connection. The Compound is integrated into the landscape and includes additional 30% spare capacity space allowance (additional isolation transformer). Allowance is in addition to the size of the enclosure required for Day 1 operations.

The Western Power Point of Connection and Main site switchboard are located at the south-east boundary of the site, within the car park and will be maintained by Western Power. The Western Power Point of Connection is a minimum of 25m<sup>2</sup> area and has provision for an additional 30% spare capacity space allowance (additional isolation transformer). Access for maintenance is provided alongside the isolation transformer.

### 3.5 Station Surrounds, Urban Design and Station Architecture (incl. ancillary buildings)

The Ellenbrook station precinct is designed to optimise the placemaking and development opportunities in close proximity to the station, with the impact of parking, services and reserves appropriately considered and integrated. In addition, the precinct design responds specifically to the quality of Ellenbrook with appropriate built form character, function and amenity, which support surrounding land use and development. This is further supported by careful consideration of legible access and seamless connections with the precinct's surrounds. Compared to coastal suburbs, temperatures in Ellenbrook are typically more extreme in summer and winter, therefore the design takes into account important design considerations including building siting, shade and wind protection of pedestrian walkways, seating and appropriate landscaping. All these design considerations are reflected in the station surrounds which consist primarily of the Welcome Place, Village Common and the carpark.

#### Welcome Place

The Welcome Place reinforces the vision of Ellenbrook to develop a range of 'villages', set in the semirural landscape of the Swan Valley and clustered around a town centre, with major elements connected by streets such as Main Street and the Parkway. The formal landscape treatment of Parkway speaks to the broader development intent to extend the town centre character into this area and the Welcome Place responds by adopting a similarly formal, rectilinear geometry that breaks the space down into a series of legible, interconnected pathways and open 'room' spaces.

These smaller spatial units help organise a 'micro-urban' framework for pedestrian movement and pause points befitting a space that must provide both easy and convenient access for people on the move, as well as comfortable places to dwell for those waiting for a ride or to meet people before beginning their next journey. Accordingly, the Welcome Place provides ample seating amenity and ancillary amenity such as drink fountains, USB charging points shade provision and public art to make the Welcome Place functional, comfortable and inviting. The rectilinear layout of the Welcome Place both reflects the character of the Ellenbrook Town Centre and also allows for legible connections with a hierarchy of pathways of varying widths.

The Welcome Place functions as both a destination in its own right and a transitory space to facilitate the journey to other destinations. It is open and flexible, supporting gathering whilst providing an opportunity for people to

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connect across their community. It is envisaged that the future commercial development frames the contiguous eastern edge of the Welcome Place will accommodate a food and beverage offering to further activate the Welcome Place and provide a continuation of its civic function. However, contrary to the station Place Plan, which seeks the accommodation of food trucks in the Welcome Place, the reference design does not seek to facilitate this activity for the following reasons:

- The overall precinct layout with bus interchange and (some) parking to the south-west and the majority of parking to the south-east of the station forecourt and most of the pedestrian and cycle movement anticipated to converge from north of The Parkway, including constraints around proximity to intersections, pedestrian movement, vehicle flows on adjacent streets, bus circulation and drop-off areas mean that access points and safe vehicle circulation within the Welcome Place is likely to compromise provision of other more permanent pedestrian amenity;
- The precinct sits on the edge of substantial community open space comprising of the Rainbow Waters Playground, proposed Youth Centre, sports fields and the local Men's Shed, which is already the site of community events and food trucks and is arguably a more important place for this kind of function given its ability to service events of greater scale and type than can be accommodated in the Welcome Place, creating unnecessary duplication of services;
- In consultation with stakeholders including LWP (the Ellenbrook master developer) and the City of Swan, there is a greater economic desire to support local business in the main Ellenbrook town centre and encourage patronage to food and beverage outlets, than to pursue transient food and beverage offerings in the Welcome Place that cannot as easily be allied with alternate economic activity.

In foregoing the constraints imposed by recreational vehicle access into the Welcome Place

To ensure comfortable pedestrian movement, these pathways are shaded by a combination of weather-proof shelters and cantilevering steel arbours with climbers, whilst a strong, coherent grid of trees will provide cathedral of green canopy over the space as trees mature. The arbours provide a visually engaging frontage to the station and precinct, reflective of their use and presence elsewhere in the town centre. The design of the Welcome Place arbours includes a decorative mesh ceiling to provide shade on 'day 1', whilst also providing the opportunity for artistic interpretation and to appropriately address Gnarla Bidji objectives (which are a continued work in progress).

Other design elements that facilitate the Welcome Place as a gathering space includes raise lawn with seating terrace, concrete paving with vapour-blasted graphics, high quality paved entry plaza with trees in grate, brick paved seating areas, brick seating walls with concrete top and recessed lighting, a selection of hardy and attractive native planting based around the Noongar 'six seasons' flowering concept, and sculptural pieces and artwork.

The area directly north of the main station entrance, fronting Parkway and directly opposite Transit Way is kept open, allowing for strong visual connection from the street to the station 'front door' as well as creating space for the siting a proposed statement piece of civic artwork. The space is largely unencumbered allowing for large numbers of people to exist the station in case of emergency. To prevent unintended and uncontrolled spillage of people directly into the Parkway / Transit Way intersection and to mitigate hostile vehicles from entering the Welcome Place from the run-up that Transit Way unintentionally provides, the Welcome Place is protected by a barrier kerb, verge garden bed and reinforced seating wall, as well as the aforementioned art piece, which is subject to future development. The presence of this verge garden bed helps soften the overall 'hardness' of the urban plaza directly in front of the station, whilst directing people to safe Parkway crossing points with side of Transit Way and encouraging people walking along Parkway to deviate slightly into the Welcome Place to a safer environment.

In terms of cyclist circulation, the Welcome Place is intentionally designed with the intent of striking a balance between accepting that some cycle activity is unavoidable, but otherwise placing an emphasis on pedestrian priority. Pathways are generous in width, though corners defined with seat walls help define space and preference the nimbler movements of pedestrians over cyclists in low-speed environments. The main bike store is proposed to be located at the western edge of the Welcome Place, adjacent to Cussington Way. Whilst a PSP is currently acknowledged entering the precinct in the vicinity of Verdant Vista from the south-east, which once having navigated the Men's Shed, travels along the rail corridor to the west of the main car park, it is intended to terminate near the Kiss and Ride drop-off, thus converting the cyclist journey into a pedestrian one whilst traversing the Welcome Place.

As an alternative cycle-only journey, cyclists coming from the south-east PSP will be able to join the Ellenbrook street network at Verdant Vista and navigate to The Parkway, where they will be able to access the bike store by turning into the main crossing point opposite Village Common. This crossing point is intentionally widened to

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facilitate access to the PSP proposed to extend north of the precinct into the Transit Corridor, and serves as a safe cycle entry point into the Welcome Place with more convenient access to the bike store than by navigating the Welcome Place from the east. The general layout and features of the Welcome Place are illustrated in the diagrammatic plan below.

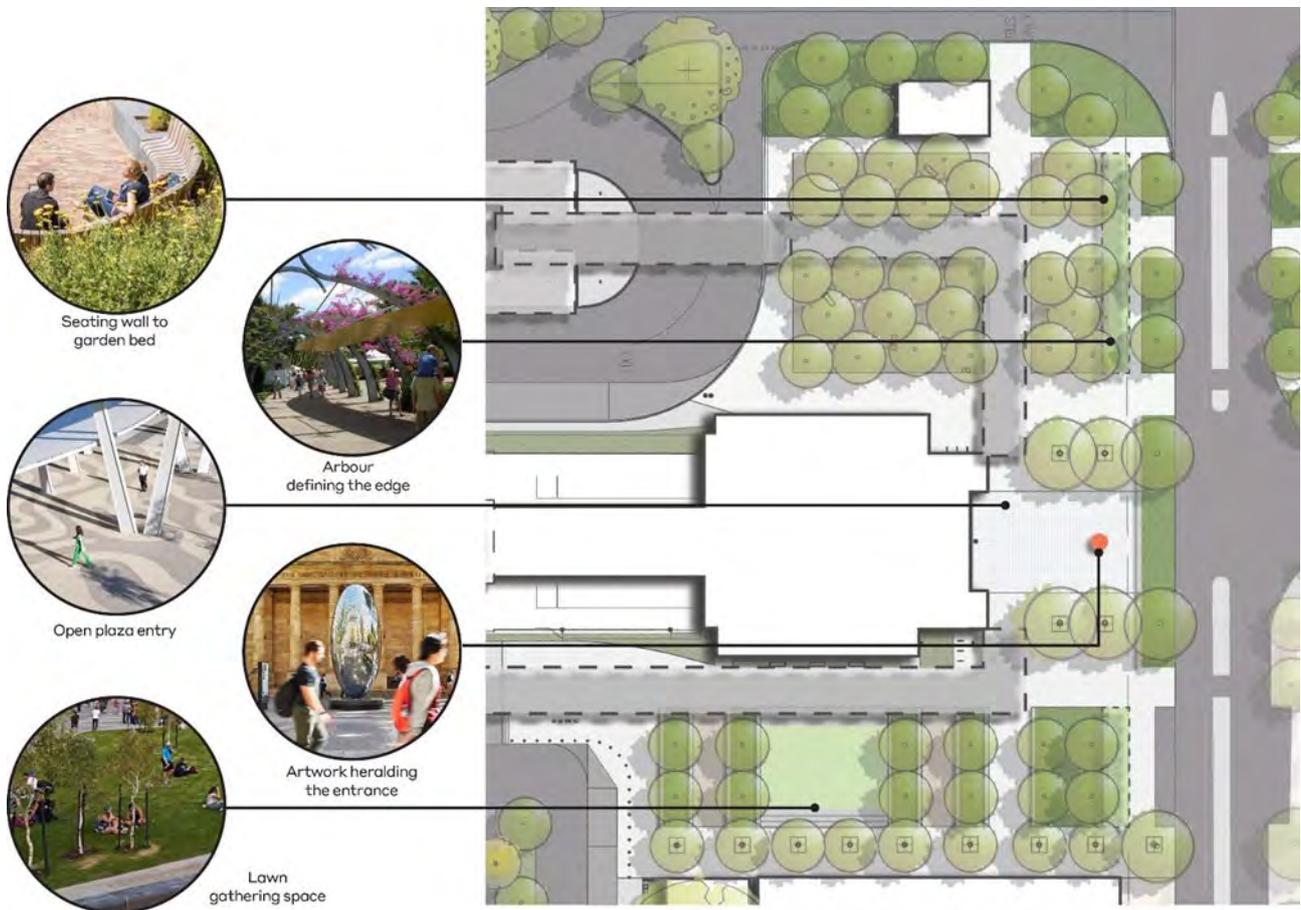


Figure 26: Ellenbrook Station Surrounding Urban Design

## Village Common

The Village Common Reference Design proposals represent a significant departure from the SWTC. Drivers for this include:

- City of Swan stakeholder engagement inputs that indicate concern with scope of works and associated maintenance burden entailed in the SWTC – especially considering the temporary nature of the works;
- Stakeholder engagement inputs from the Ellenbrook town centre developer (LWP) indicating a preference to not to accommodate food trucks in Village Common out of concern of impacting patronage in the retail heart of the town centre;
- An apparent duplication of amenity based around food truck services and community event space that is already accommodated in Charlie Gregorini Memorial Park (located to the south-east of the station precinct);
- Constraints on available water availability for irrigation required to sustain the SWTC proposed landscape treatments.

Given these considerations, the proposed landscape design focuses on a lower maintenance, functional solution that enhances its role as a connective space within the town centre. In addition, it is proposed that the Village Common tie into the pattern of more established treatments further north within the corridor. The transit corridor precedent is largely based around a groundcover revegetation treatment, diagonally aligned double rows of *Eucalyptus marginata* offset in rows approximately 20m apart.

To translate this into the town centre context the proposed design is based around five spatial-structural elements, as follows:

1. **Urban Edge** – Street verges are proposed to be treated to consistently with the town centre context, including consistent pavement and tree selections that conform to the town centre street tree master plan;
2. **Central Connection** – A central PSP creates a convenient, safe, direct and clear connection linking Ellenbrook Station with the town centre in compliance with the broader PSP strategy;
3. **Canopy Diagrid** – Diagonal double-rows of local native tree species reflect the corridor aesthetic and are aligned to create an intuitive visual connection to the station that improves wayfinding;
4. **Celebrate Nature** – A carpet of waterwise, ‘six seasons’ inspired wildflower gardens create the opportunity to showcase a mix of native and exotic plants that provide year round colour and an expressive counter-balance to the strong linear forms of the Village Common;
5. **Safety and Comfort** – Open and clear sightlines and functional lighting to the street verges and PSP complement bench seating that improve night-time safety and provide opportunities to pause and enjoy a restful botanical experience.

From the simple and legible urban landscape form created by the proposed scheme, there is ample flexibility to incorporate additional amenity in the future as the town centre develops around the station precinct over time.

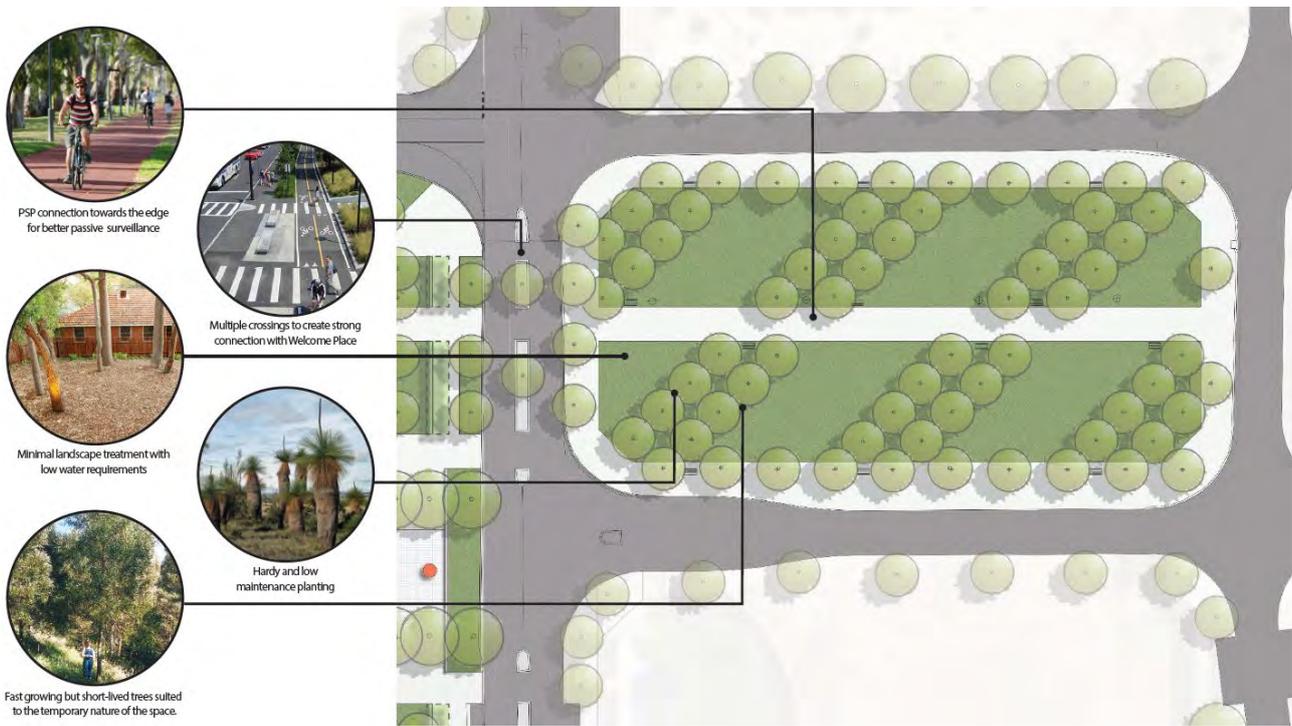


Figure 27: Village Common Urban Design

## Park and Ride

Another major element that forms the station surrounds is the carpark. The corner of the carpark abuts the Welcome Place which is facilitated by Kiss n’ Ride amenities, which include weather-proof shelter, ticketing machine, seats and trees. The rest of the carpark was designed to maximise the number of parking bays and allow legible circulation of both vehicles and pedestrians. To maximise parking capacity, the carpark extends flank both sides of the rail line, with a dedicated staff parking area that is enclosed and managed. Significant number of trees and swales have been incorporated into the carpark to provide shade amenity while integrating sustainability initiatives, which is illustrated by the sections below.

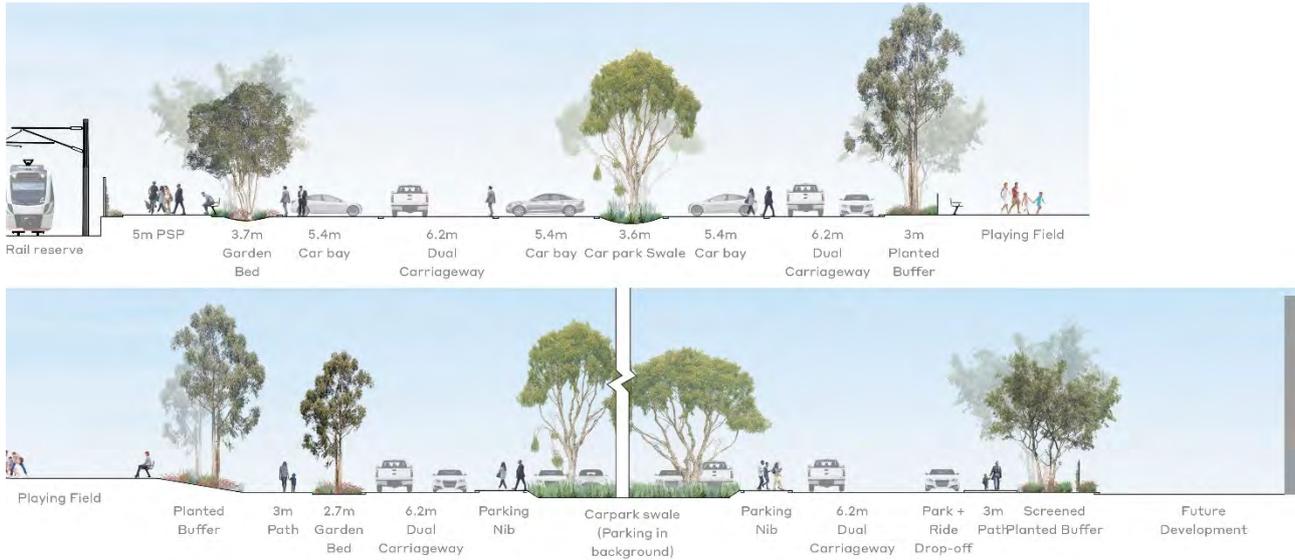


Figure 28: Ellenbrook Station Sustainable Initiatives through Urban Design

### Softscape Strategy

The planting is a significant component that makes up the station surround and urban design. The proposed planting palette reflects the immediate and surrounding natural landscape of the Swan Coastal Plain, Darling Scarp and the rugged Perth coastline. The species will provide significant shady canopies, year-round flower displays, habitat for native birds and insects, a celebration of cultural significance and the Noongar Six Seasons, important drainage and rehabilitation functions in addition to a hierarchical arrangement within the public realm. The precinct has six planting types that are each uniquely located to reflect the different areas within the site. The intention of this approach is to achieve specific functions such as drainage and rehabilitation zones, to create an inviting 'Welcome Place' for Station users, develop the station and precinct narrative through the incorporation of design themes such as the Main Roads Wildflower Capital Initiative and instilling a sense of place by selecting species reflective of the Noongar Six Seasons to develop the understanding of the cultural significance of the site.

### Planting Hierarchy

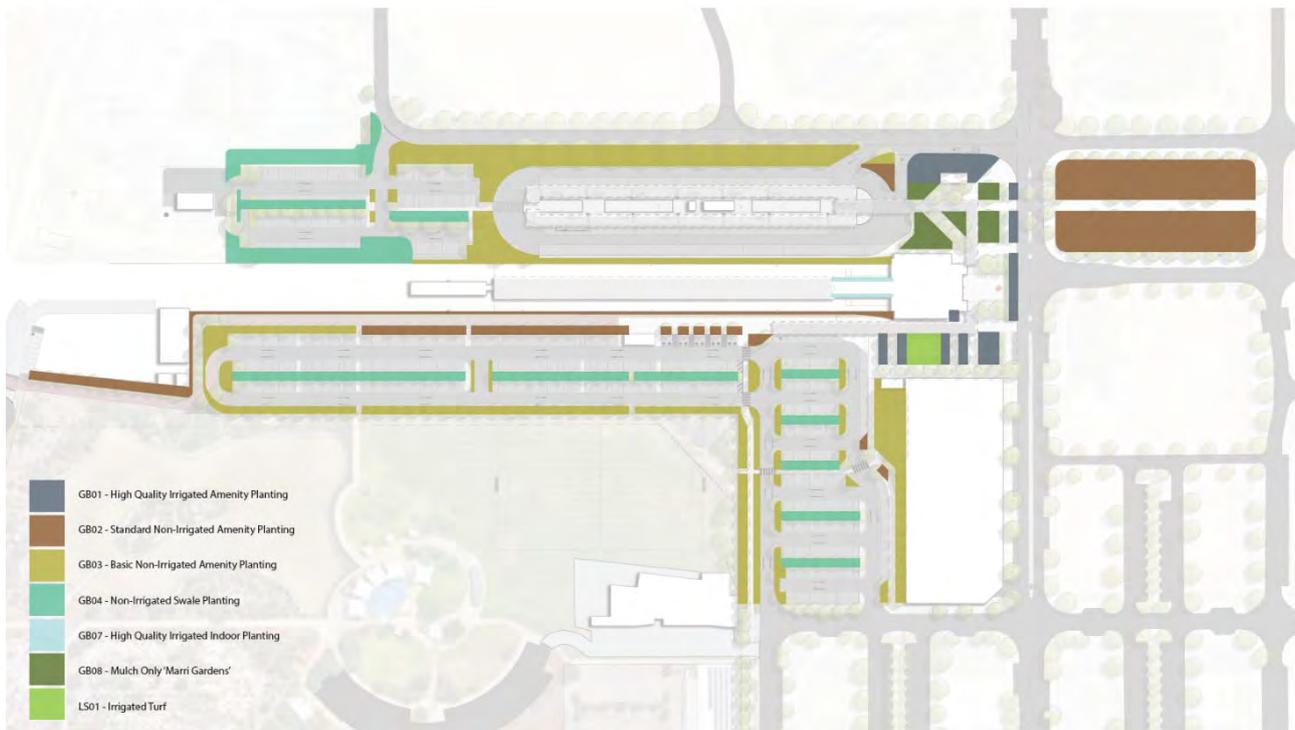


Figure 29: Ellenbrook Precinct Planting Hierarchy



Figure 30: Ellenbrook Station Planting Selection



Figure 31: Ellenbrook Station Architecture and Surrounds

### 3.6 Impact of Station Building on Public Domain

The design follows station functional planning and urban design specifications to see that the massing and height of the development is appropriate in its setting, and that the built form compliments the future character of the public domain. As *The Ellenbrook Development Pan* is distinguished by seven-character areas, being the Main Street, High Street Station, Drummond, Hesperia, Community and Learning, The Promenade, Reveley and Southside, the design wants to speak to the themes and gestures of these areas. Similarly, to the community and learning areas, the site will be the heart of community interaction, some recreation and civic identity. The site will also capture the energy of the adjacent Main Street and have some intensely activated zones of pedestrian activity like the High Street Station. As with the surrounding areas of local character, the precinct will see the development of predominantly mixed residential and commercial development, requiring similar understanding of the future functional development of the area.

The scale, massing and views and vistas of the place will reinforce a local coherent identity. At ground level, the building offers a place of positive public realm to interact with the future mixed-use development that will occur at grade. The stations entry and emergency exits are primarily located facing The Parkway and give users direct access to large areas of public space. Patrons have minimal thresholds to pass through before connecting with the public domain.

In addressing the present public surrounds, the design sees the retention of two primary northerly connections of The Parkway and Ellen Stirling Parade. The street grid retains primacy and legibility in this way. The layout also attracts activity from the south, northwards from the current shopping centre, and incorporates civic uses and public spaces suitable for a Town Centre. Opposite the station entry, The Village Common space is to be activated as a community grounds under direction from The City of Swan. The Village Common space is likely to include landscaping that features hardy and low maintenance planting, low-lying shrubs and fast-growing trees suited to the temporary nature of the space. Plans endeavour to see minimal landscape treatment with low water requirements.

### 3.7 Access and Movement

The design considers the wider network of off-road cycle paths and/or shared paths that connect into the precinct and key infrastructure / assets that are within walking distance of the station. There is particular emphasis on two Principal Shared Paths one from the south, and the other from the northern future rail corridor. These PSP connections are extended into the Welcome Place and connect to one of two bicycle shelters and bicycle parking areas. The bike shelters have been located to minimise conflict between bicycles and pedestrians.

Pedestrian activity through the Welcome Place is highly desirable and will be encouraged through the integration of pedestrian corridors, covered walkways, shaded arbour structures and tree canopies. Access plans identifying current and future pedestrian desire lines and key movement corridors are reflected in the diagram below:

Pedestrian Connectivity to Wider Networks

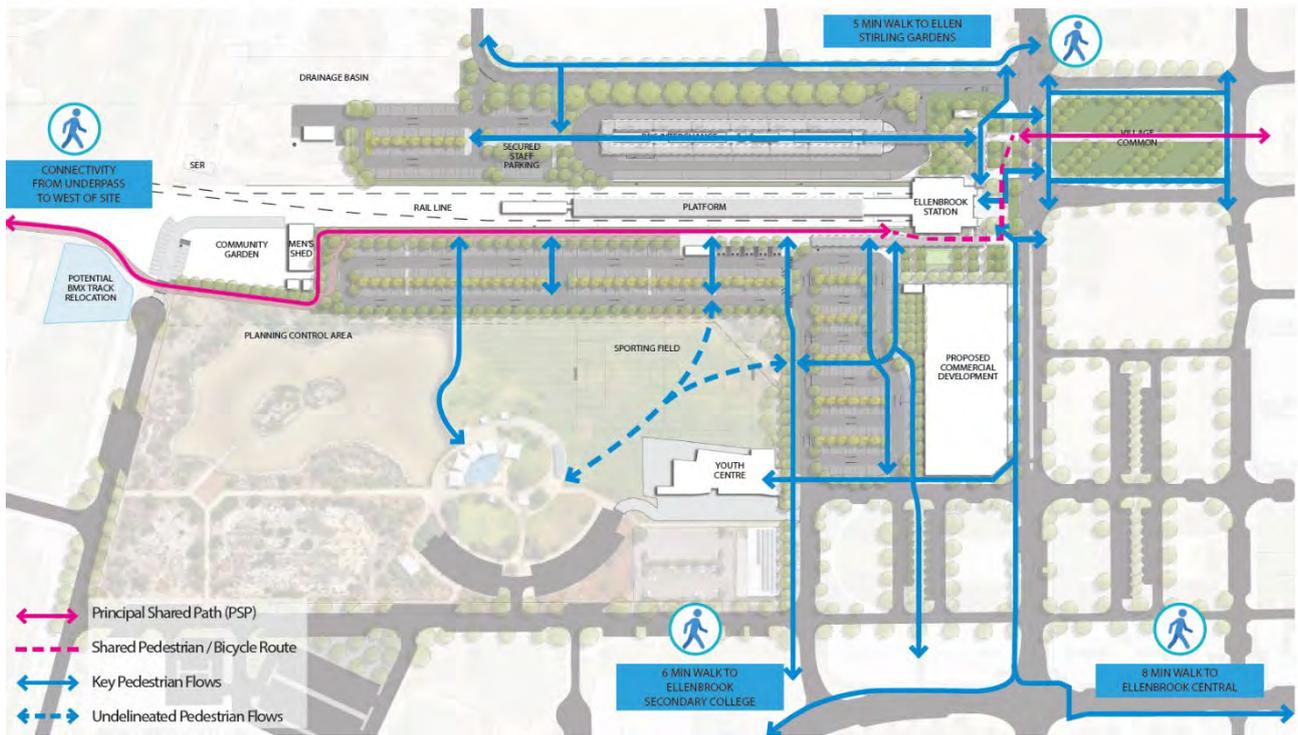


Figure 32: Pedestrian Connectivity to Wider Networks

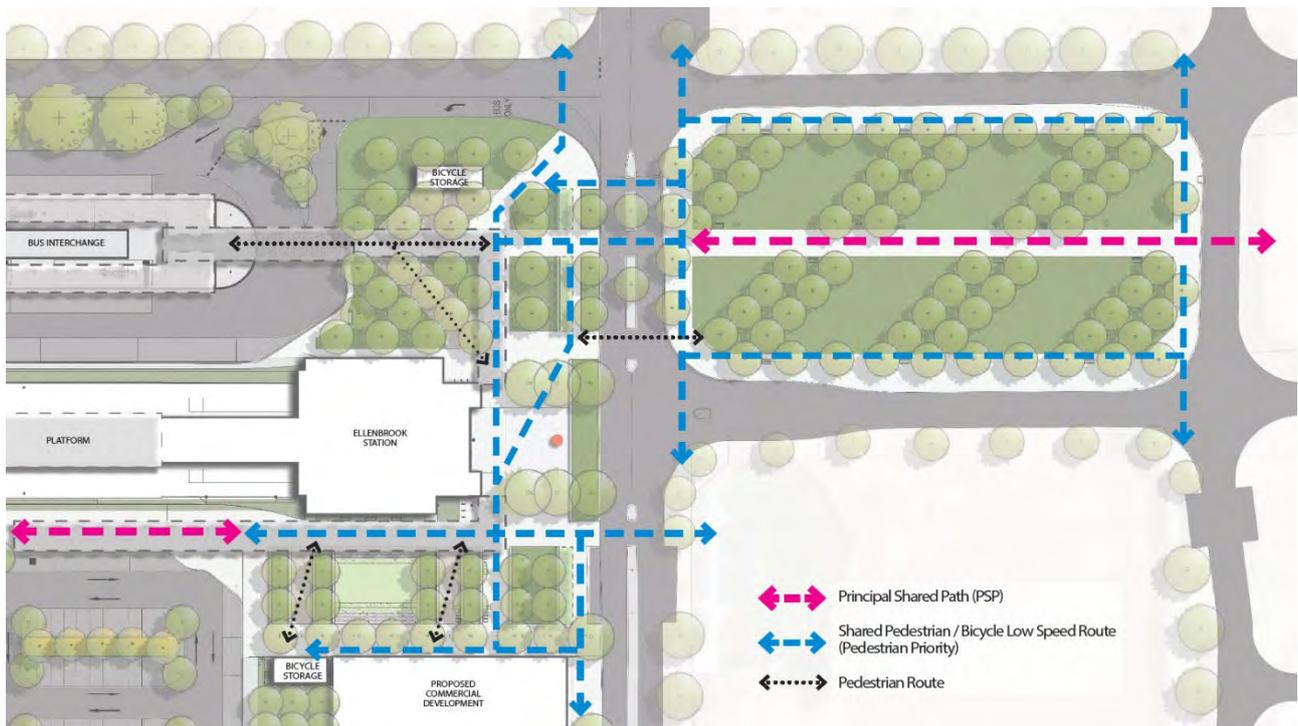


Figure 33: Circulation through the Village Common and Station Welcome Place

### 3.8 Preliminary Wayfinding Strategy

There are unique visual and physical linkages that aid with way-finding and sight-lines throughout precinct and station. Both visual and physical linkages will receive careful consideration, with a key objective being to create linkages that provide a sense of surprise, interest and discovery at regular intervals. Key elements contributing to navigation can be found on the way to and from the forecourt of the station entry. Manmade shade structures and natural tree canopies will aid in pedestrian navigation, as they frame views and illustrate path continuity along

corridors. Paving patterns, planter beds, lighting and signage further aid in wayfinding within this space. From the Welcome Place and station entry, there is a clear view through the station concourse out to the platform, this is a unique feature of this station. Additionally, a linear skylight running the length of the roof acts as an intuitive wayfinding tool that leads you through to the platform and back. Illumination, signage and the scale of the building make it clear to visitors and staff of their whereabouts.

The architecture of the station building aids in creating strategic wayfinding, as its mass can be viewed “in the round” from various angles of the surrounding precinct. The design of the shade canopies further hint at the location of the entrance to the station as they lead you intuitively from the other modes of transport to the entry point.



Figure 34: Key Wayfinding Sightlines from The Parkway and Carpark Drop-off

Visitors to Ellenbrook Station will also be greeted by an arbour form; a form that aids in breaking the edge of the built form before the street edge. This arbour piece will aid in wayfinding, as it may be lit in the evening time to act as a navigation beacon. Additionally, this element softens the street condition and seeks to be another “attractor piece” and entry portal for those catching the train or bus. This gateway element entices people through its form and will clearly define the welcoming space of the station.

### 3.9 Signage Strategy

The precinct and station signage strategy is in accordance with The Government of Western Australia’s Public Transport Authority standards. The MELConnx team have referenced the Public Transport Authority Signage Guide, documents ‘MELAD-PTAWA-AS-REF-0001.0.IFU’ through to ‘MELAD-PTAWA-AS-REF-00010.0.IFU.’ The signage strategy considers visibility but also considers conflicts and hierarchies with other elements such as public art, advertising and PTA’s branding elements. The signage design will be coordinated in conjunction with PTA.

Key signage throughout the precinct addresses identification to and from the bicycle shelters, bus interchange, carpark and emergency egress. Station Identification is provided throughout the station platform, at consistent intervals in both parallel and perpendicular sightlines to the platform. This will aid in wayfinding for pedestrians

walking along the platform edge, as well as commuters using the train service approaching the platform in navigating their location along the Morley-Ellenbrook Line.

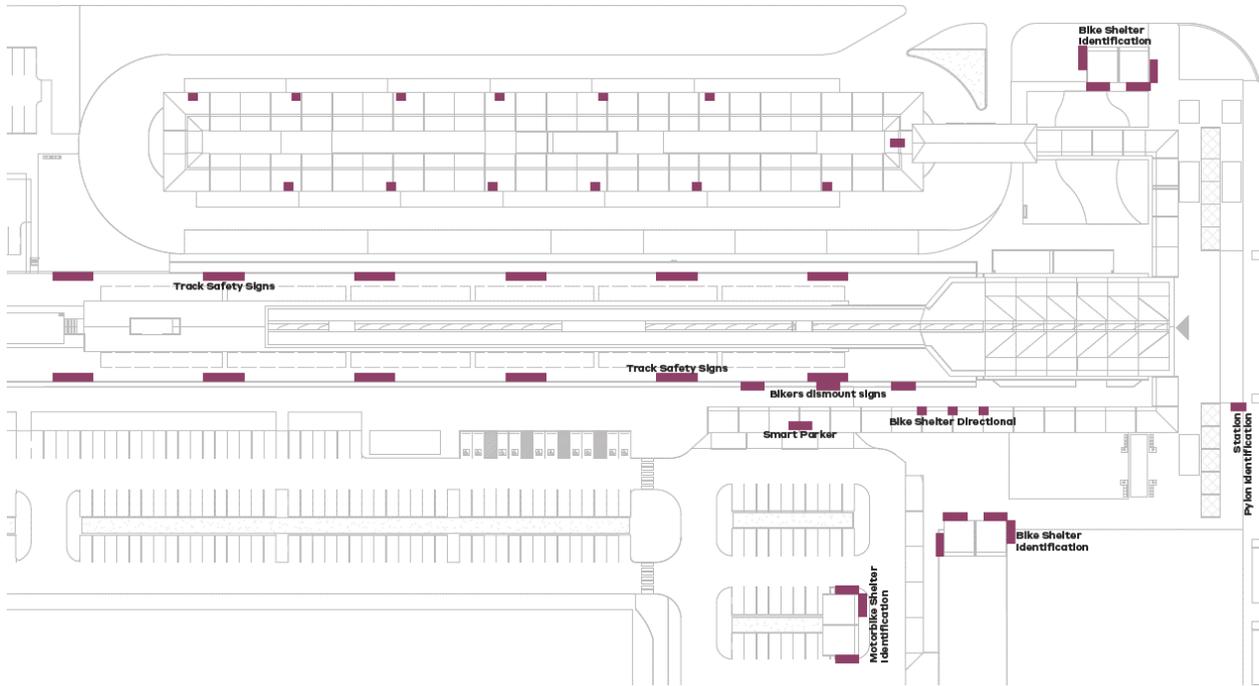


Figure 34: Indicative Signage Strategy at Station Ellenbrook Precinct



Figure 35: Indicative Signage Strategy at Station Ellenbrook Concourse

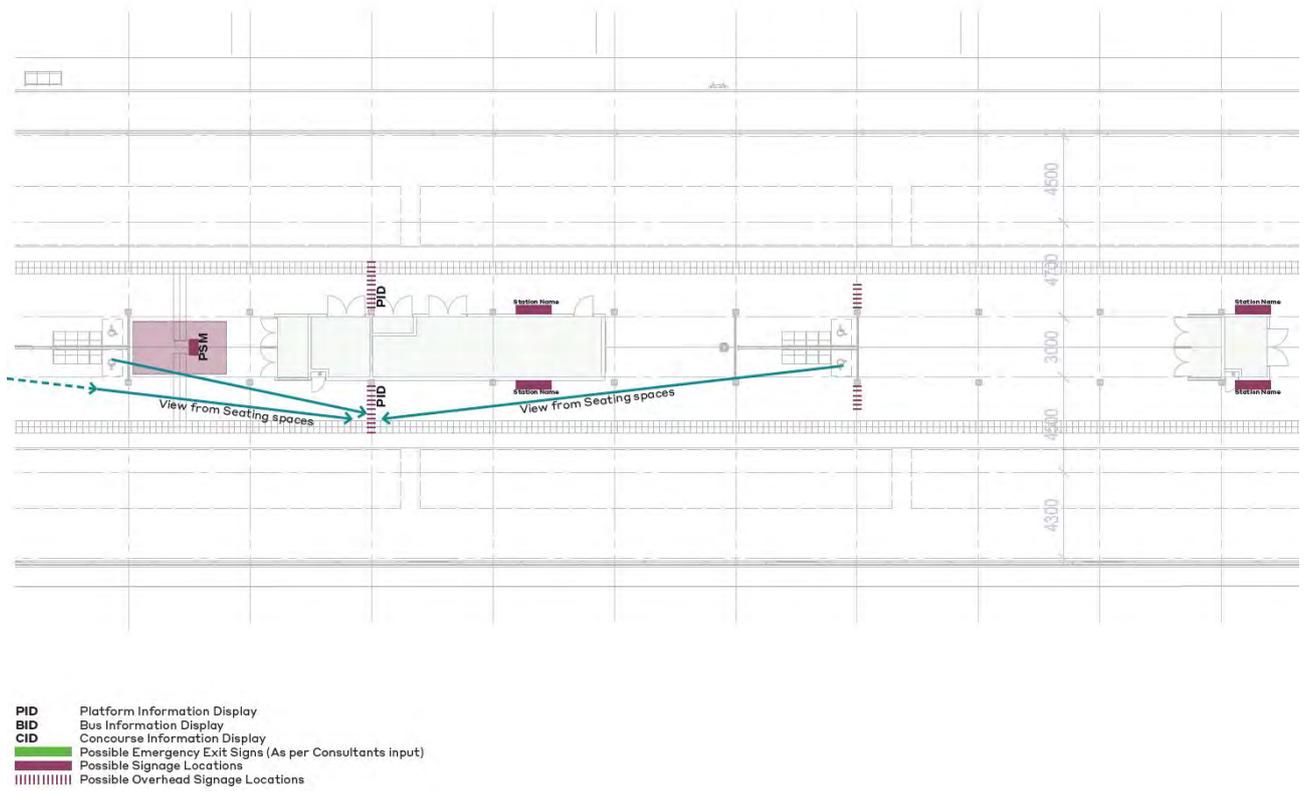


Figure 36: Indicative Signage Strategy at Station Ellenbrook Concourse

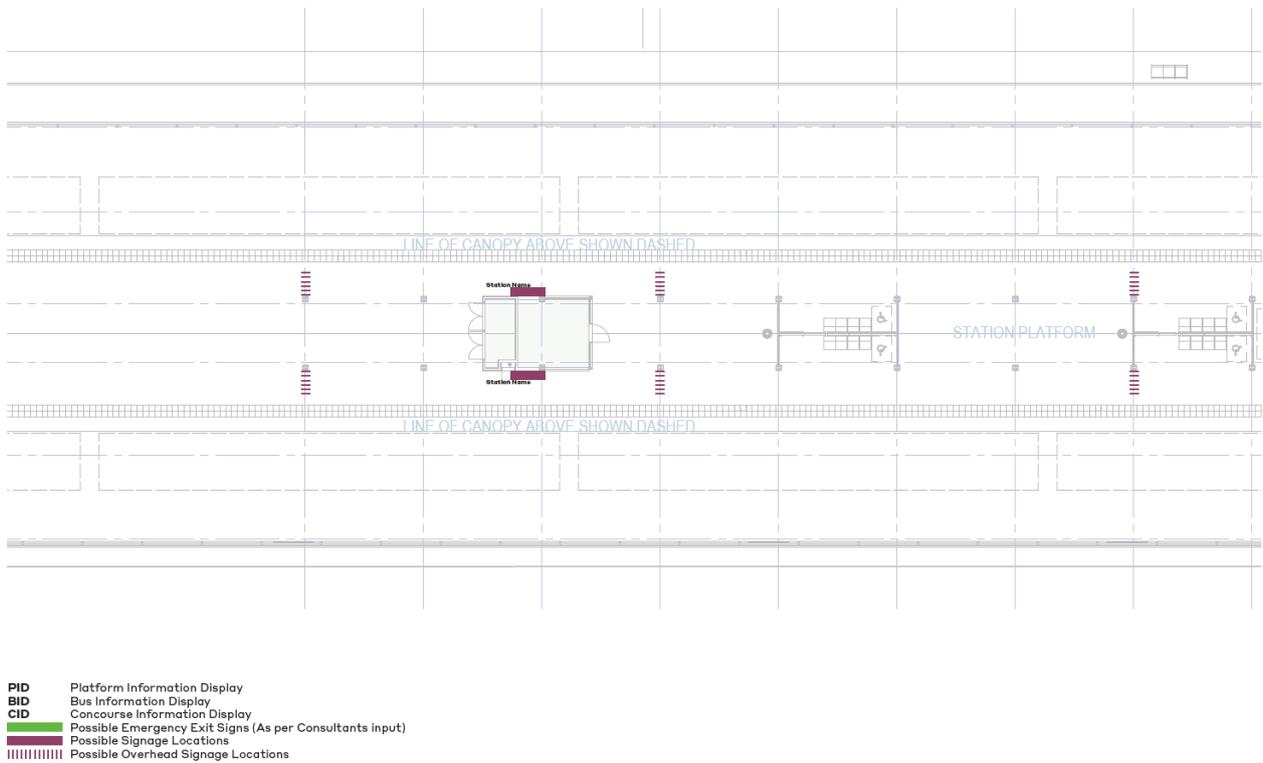
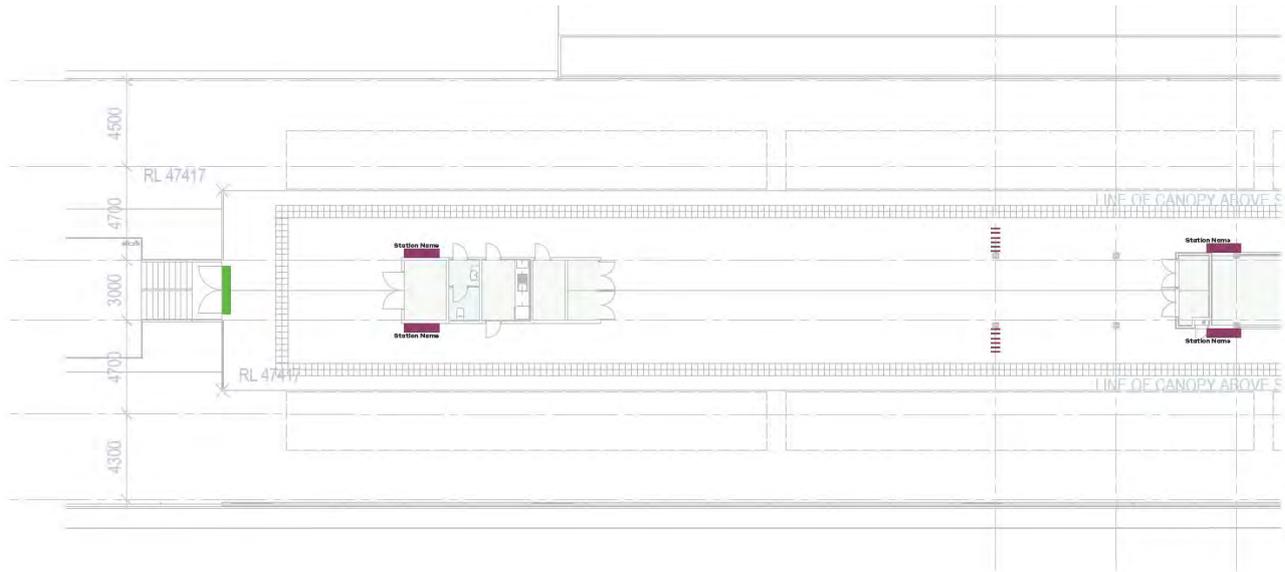


Figure 37: Indicative Signage Strategy at Station Ellenbrook Concourse



- PID Platform Information Display
- BID Bus Information Display
- CID Concourse Information Display
- Possible Emergency Exit Signs (As per Consultants input)
- Possible Signage Locations
- Possible Overhead Signage Locations

Figure 38: Indicative Signage Strategy at Station Ellenbrook Concourse



Figure 39: Indicative Signage Strategy at Station Entry Building

Platform Information Displays (PID) will be viewed from all seating spaces along the platform. These 79-inch screens convey waiting times and train schedules. Similarly, within the Concourse area, Concourse Information Displays are at appropriate locations on 49-inch screens, to view the train timetables. Bus Information cubes are also evenly dispersed to provide similar information at the bus interchange areas for travellers.

Signage at the Station Kiosk plays an integral role in the identity of the tenant. This signage is to identify the shop name only and not spell out the type of merchandise it is offering (Section 4.2 PTA Tenancy Design Guide). Further to this, the principal signage will be three-dimensional and illuminated. Where possible, the location of principal signage for the kiosk is vertically located and/or suspended and the use of fluorescent fittings will be avoided.

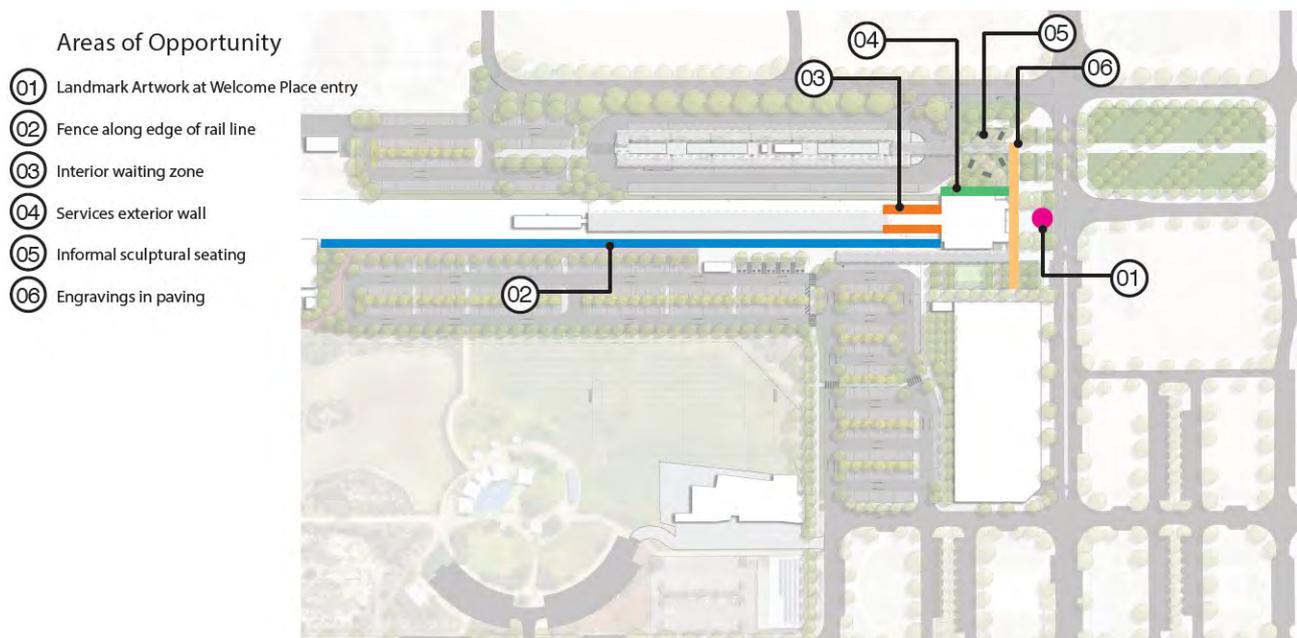
### 3.10 Public Art Strategy

The strategy is for public art to play an important role in the cultural identity of the station and Welcome Place, providing social, economic and environmental benefits to the surrounding public and commercial interfaces. Following Metronet's Public Art Principles, the drive behind the design is to deliver a diverse program of high-quality progressive, bold, meaningful, and inspiring public art that is reflective of and valued by the community. Art intends to support the appeal and legibility of public spaces connected to stations and other transport infrastructure by creating points of interest, landmarks and destinations, supporting walkability and building a sense of adventure. Further to this, art will help animate the space and showcase local cultures. In consultation with the public art consultant, we have worked together to inform this strategy and design response for the Ellenbrook station.

The design team have explored the thematic directions relating to the line-wide concept narrative spanning Morley to Ellenbrook and the unique themes specific to Ellenbrook. Noongar engagement will establish the foundations for the cultural context and narratives of country to be interlaced throughout the public art. Engagement with the local communities will consider the interpretation of themes and stories to enhance deeper connections between people and place. This is achieved through shared community experience, greater enjoyment of space and authentic representation of local character and identity.

The Morley-Ellenbrook Line Public Art Plan will also be underpinned by policies and strategies of the Western Australian Government (Percent for Art scheme, Metronet Public Art Strategy, 2019) and the aspirations of The City of Swan.

The below diagrams identify the possible areas of opportunity for integrated public art at Ellenbrook Station and outlines possible line wide themes and themes specific to Ellenbrook.



### Ellenbrook Themes:

Story of Yagan  
Start of the Journey

### Linewise Themes:

The Six Seasons  
Interpretation/stories from  
cultural context  
Dual Naming

### Areas of Opportunity

- 01 Landmark Artwork at Welcome Place entry
- 02 Fence along edge of rail line
- 03 Interior waiting zone
- 04 Services exterior wall
- 05 Informal sculptural seating
- 06 Engravings in paving

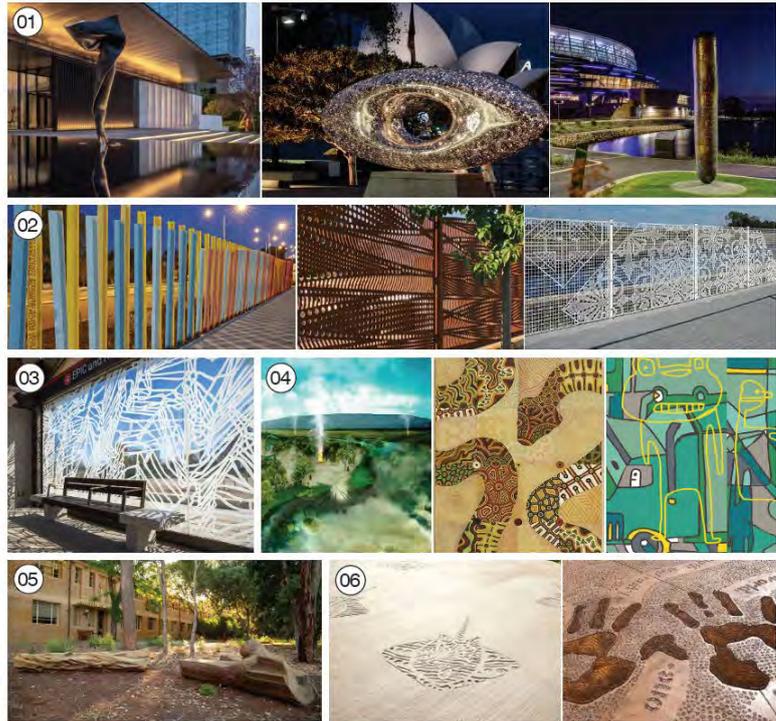


Figure 40: Indicative Public Art Areas of Opportunity

[For further information, please refer to Appendix KK, Project Public Art Plan.](#)

## 3.11 Access Cleaning and Maintenance strategy

General access and maintenance principles and procedures for cleaning and maintaining the station are identified in the PTA guideline 8803-000-002 Specification, Maintainability and Constructability. These principles have been incorporated into the access, cleaning and maintenance strategy for the Ellenbrook Station Design as far as practicable at this early stage of the project. A safety access consultant / specialist is to provide final designs for roof / high level safety access and maintenance system based on this strategy.

Elements of the cleaning and maintenance strategy for the station building that have been considered are as follows.

### Roof Maintenance Strategy

- Roof access ladder hooks, static lines and anchor points are provided where required to provide full access to all roofs and canopies.
- Access via fixed ladders to accommodation roof and eaves gutters.
- The central skylight of the main roof is trafficable with static line and walkway provided on either side.
- The roof gradients have been designed to be trafficable.

### Soffit Maintenance Strategy

- Soffits of the station roof and bus canopies have been designed with high level access via EWP for cleaning, maintenance to lights and /or soffit.
- Lighting and services have generally been located centrally for ease of access.
- Accessible ceiling types have been provided to all rooms where moisture is not a concern for flexibility and easy access to in ceiling services.

### Façade and Window Maintenance Strategy

- Façade maintenance from ground level using elevated work platforms (EWP) as necessary.
- Small sized windows have been included in the Station Building to minimise maintenance and cleaning.
- Weather protection provided to key waiting areas and entrances to minimise the maintenance to these high traffic areas

### Afterhours Access

- After hours station access will be via secure roller shutters located on the ground level.

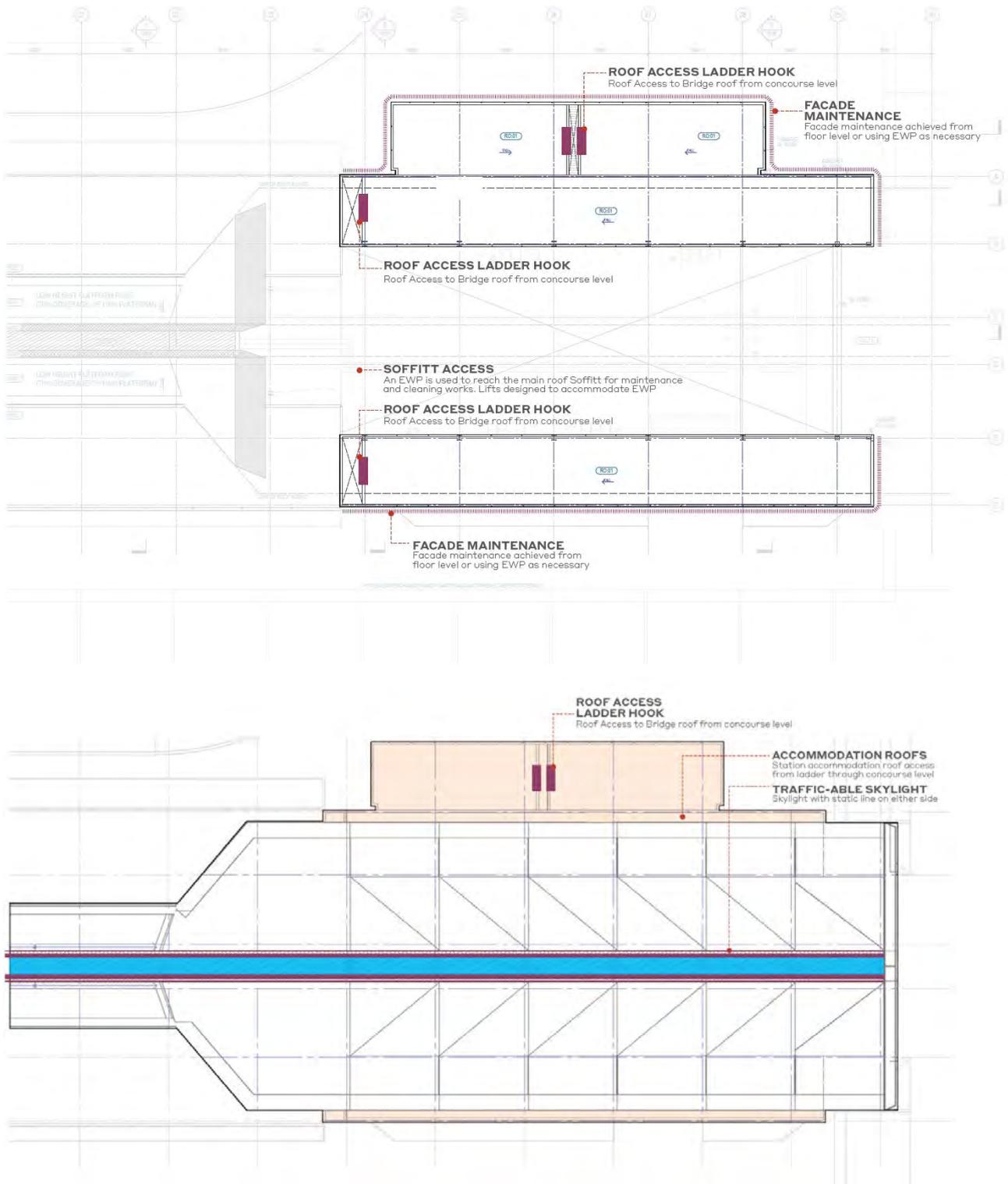


Figure 41: Ellenbrook Station Access and Maintainability

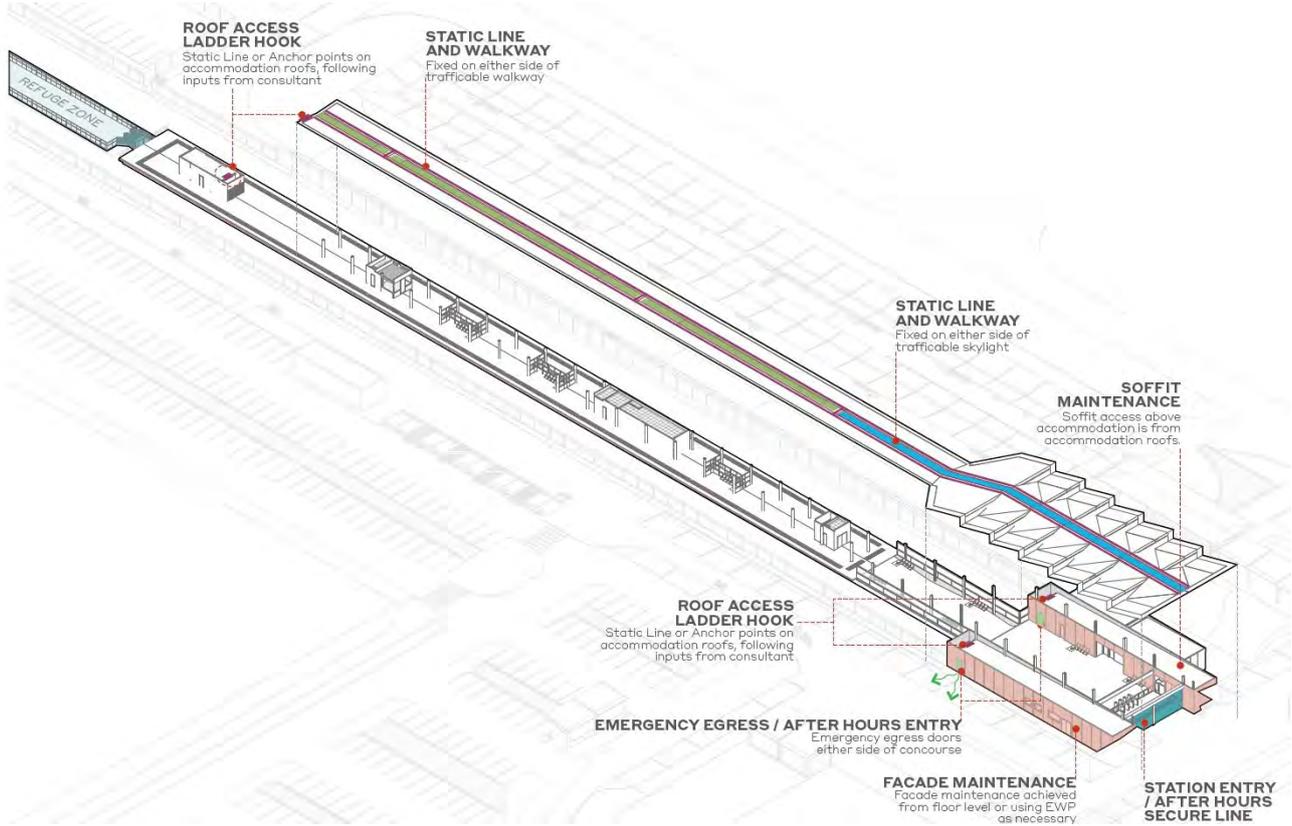


Figure 42: Ellenbrook Station Access and Maintainability – Station Isometric View

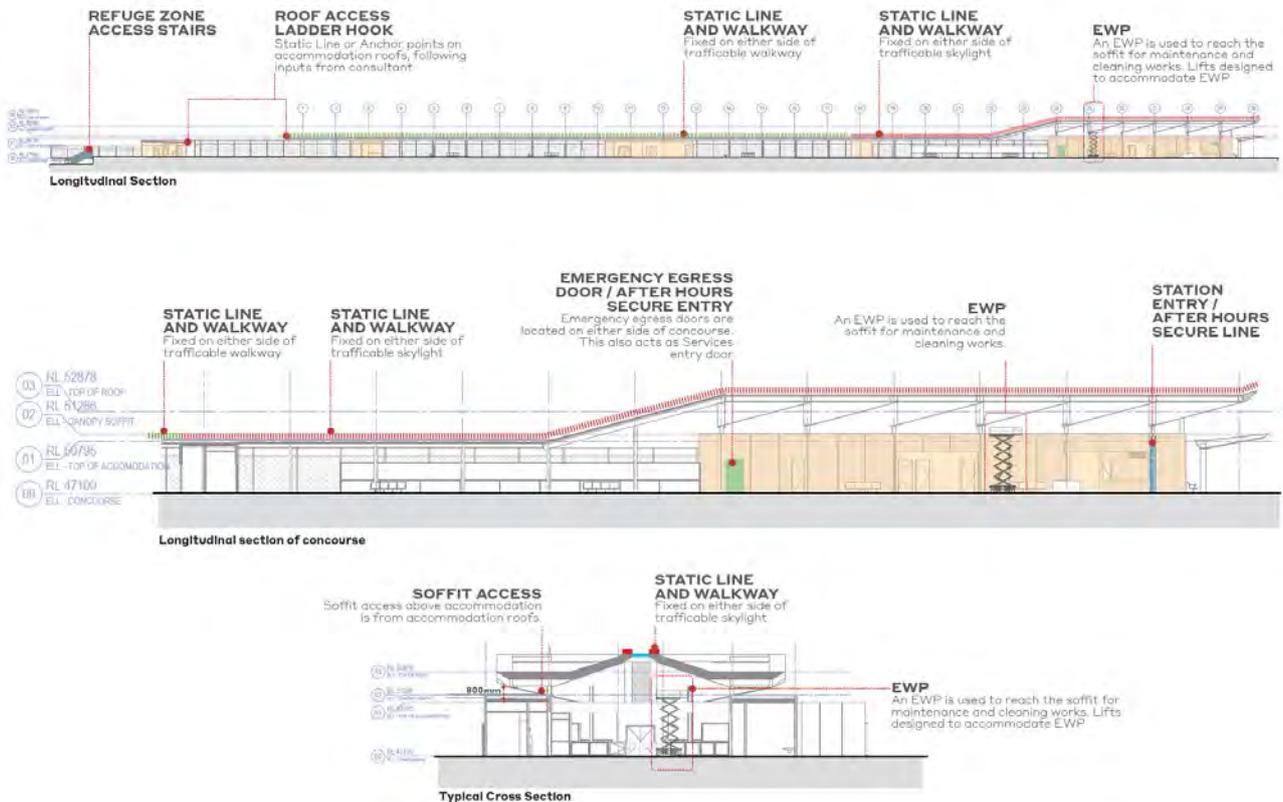


Figure 43: Ellenbrook Station Access and Maintainability Sections

The Welcome Place, Village Common, and Carparks have been designed for easy maintenance access with wide footpaths and trafficable paving provided. The hardscape materials are of relatively low maintenance including in-situ concrete, brick, stone pavers, and asphalt. The softscape consists mostly of hardy native species that are drought tolerant.

The landscape design of the Ellenbrook Station precinct aims to ensure that the outcomes minimise ongoing operation and maintenance costs for the PTA. This includes ensuring all weed burden (weed infested site topsoil) is not reused within reserve landscaping, safe maintenance access is provided, appropriate tree species have been chosen, low maintenance wall seating finishes, consideration of skate deterrents.

To facilitate landscape maintenance in the Welcome Place, there are a number of power and water points for equipment and hose connection. These services are housed in lockable pits or boxes, locked to PTA standard key. In the case of GPO power outlets, boxes with outdoor rated connection points are proposed to be built into purpose made recesses in selected seat walls, whilst hose-cock connections are proposed to be accommodated in lockable underground pits. The water points will feature inverted faucets to facilitate hose connection at ground level. Water points are proposed to be located within garden beds next paths, to minimise the potential of a pedestrian tripping whilst the service lid is open.

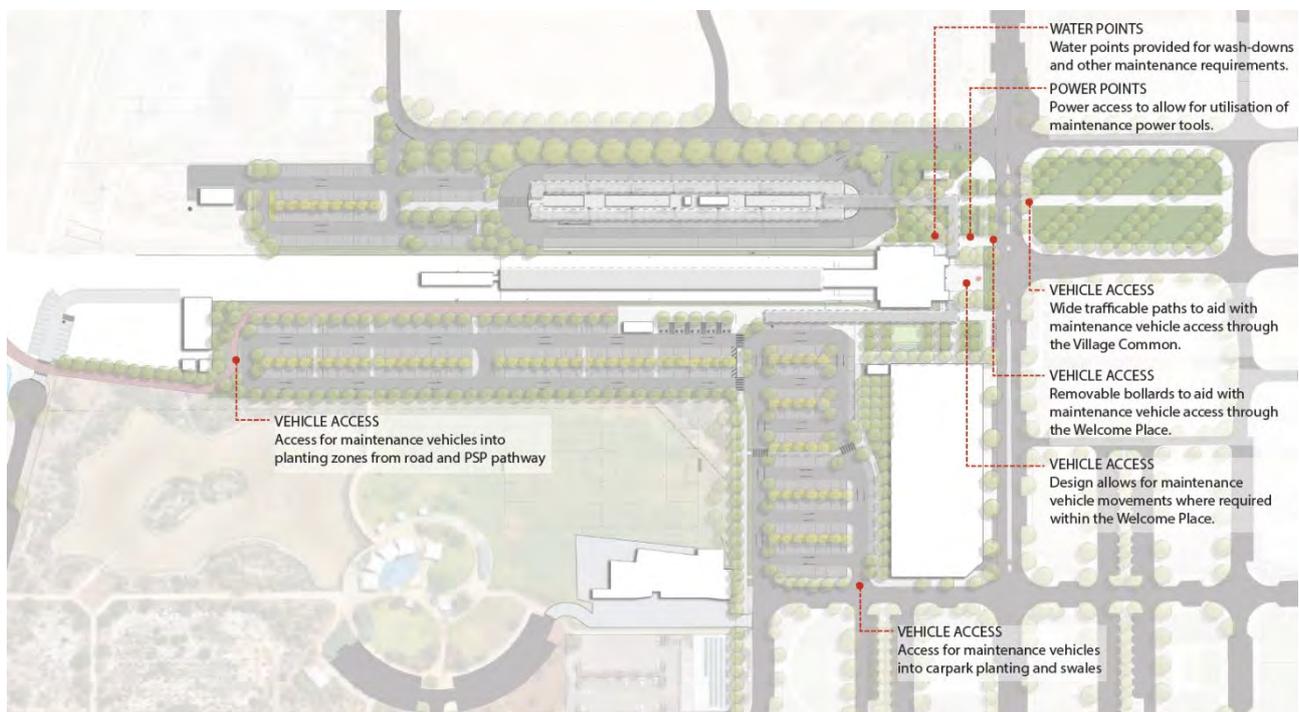


Figure 44: Ellenbrook Precinct Vehicle Access

### 3.12 CPTED Review

CPTED has been reviewed in conjunction with the Safety and Security Report. The four key principles of CPTED are:

1. Natural surveillance (lighting, activation, sightlines);
2. Natural access control (movement predictors, wayfinding);
3. Territorial reinforcement (ownership, landscaping);
4. Maintenance and management.

The design of the station and surrounds takes these principles into consideration:

#### Natural surveillance

Natural / passive surveillance and unimpeded views across the precinct and station areas has been considered with:

- The use of low-lying planting, the tree selection plus considering under-pruned tree canopies and key sight-line studies
- Tree canopies are underlit
- Shade canopies are underlit / downlights at night
- Precinct parking areas that are well lit, have low planting and under-pruned tree canopies to provide clear, unimpeded views and passive surveillance
- The use of landscaping that does not provide an opportunity to hide
- Bike shelters that are transparent (open mesh construction) – eliminates potential hiding spots
- For windows from staff occupied areas within the station to provide views out onto the car park, drop off and bicycle shelter area.

### **Natural access control**

- Planting, trees and landscaping structures will act as barriers to limit access into non-public / service building areas.
- Public routes, pathways, PSPs etc. are carefully located to follow natural routes and are clearly identified through the use of materiality, lighting and landscape design
- Design provides a clear indication of where people are allowed and where they are not allowed.
- Where additionally necessary, bollards standing approximately 1100mm high will direct access and halt vehicle crossing.

### **Territorial reinforcement**

People will be less inclined to vandalise or neglect a relatable building and precinct. Within the precinct some strategies have been taken to help people develop a sense of ownership and pride by providing:

- A strong sense of place that considers design elements that reflect the local community and heritage.
- Seating and furniture throughout the precinct that encourages people to meet and gather, improving their relationship with the station and providing a comfortable space for legitimate users.
- Materiality throughout that is durable and hardy while being reflective of local surrounds
- Clear delineation between public and non-public spaces through landscape, planting, surface treatments, fencing etc.

### **Image, Maintenance and management**

The upkeep of the site will be a sign that the area is cared for, and therefore feel safe and discourage criminal behavior. The design aims to provide:

- Materials that are low maintenance and easily cleaned
  - Landscape that is low maintenance
  - Protective measures such as anti-graffiti coatings will be implemented.
  - The strategic placement of rubbish bins.
  - Urban furniture are to PTA specifications with all drink fountains, bike hoops, seating and bin enclosures fixed down and vandal proof
-

The design of the station and surrounds takes these principles into consideration further elaborated in the strategies here:



#### Lighting

Provide adequate illumination of a space both during the day and at night which enables people to see and be seen

##### Integrated initiatives

- Lighting standards & levels
- Spacing
- Type
- Siting and Situation



#### Sightlines

Provide maximum visibility of the immediate and approaching surroundings by creating an unimpeded view across pathways

##### Integrated initiatives

- Passive surveillance
- Direction of pathways



#### Ownership

Generate a sense of proprietorship amongst owners and users of a space, to encourage people to take responsibility for that space and protect it

##### Integrated initiatives

- Clear border definition
- Surface treatments
- Transitional zones



#### Movement Predictors

A predictable or unchangeable route or path that offers no choice to pedestrians

##### Integrated initiatives

- Eliminate movement predictor routes
- Provide access to alternate routes



#### Wayfinding

Enable the environment to convey a sense of place and provide orientation and direction, including an indication of safe places and routes

##### Integrated initiatives

- Signage
- Legibility
- Features



#### Landscaping

Increase the safety of a site by transforming the overall landscape, through the use of vegetation

##### Integrated initiatives

- Selection of plants
- Clear trunk trees with lifted canopies
- Low understorey planting
- Layered planting with lows species adjacent paths



#### Entrapment

Avoid entrapment spots, particularly adjacent to pedestrian routes, a predictable/unchangeable path or a dead-end

##### Integrated initiatives

- Eliminate entrapment spots
- Limit access if entrapment is unavoidable



#### Activation

Modify the range of land uses in a space in order to facilitate an appropriate mix of activities occurring in the environment

##### Integrated initiatives

- Gathering areas
- Compatible and balanced use of space

Figure 45: Ellenbrook Station CPTED Response

### 3.13 Security Risk Assessment

Refer to CPTED Report.

### 3.14 Lighting Strategy

#### Station Building

The precinct and station lighting strategy is in accordance with The Government of Western Australia's Public Transport Authority standards. The MELConnx team have referenced the Public Transport Authority, 'Lighting Design, Installation and Maintenance Requirements' specification document, as well as related PTA documents and drawings to develop the strategy. The lighting design is to consider the requirements of customer facilities, secondary facilities, signage, CCTV, DAVs, advertising, station furniture, roof lights and architectural finishes within the station. It is key the lighting provides for good surveillance and a safe environment.

The strategy is to address the vulnerable areas of the station, such as areas at high risk of vandalism, crime, safety, weather conditions and moving trains. The lighting fixtures and installation is to be robust and easy to maintain. Lighting assets will further be standardised across all the stations on the line in terms of installation, maintenance and compliance longevity.

Within the station, the design strategy considers the use of LED lights integrated into a recessed strip running the length of both sides of the skylight spine to illuminate the concourse and platform areas. Concealed lights within an extruded steel channel will be fixed to the roof of the accommodation to shine up and illuminate the roof soffit. Additional spotlights will highlight all other areas of the station where required including signage and information screens that will be back lit for legibility. No lighting will be provided for within the kiosk tenancy. All internal finishes and lighting will be provided and installed by the Kiosk Tenant.

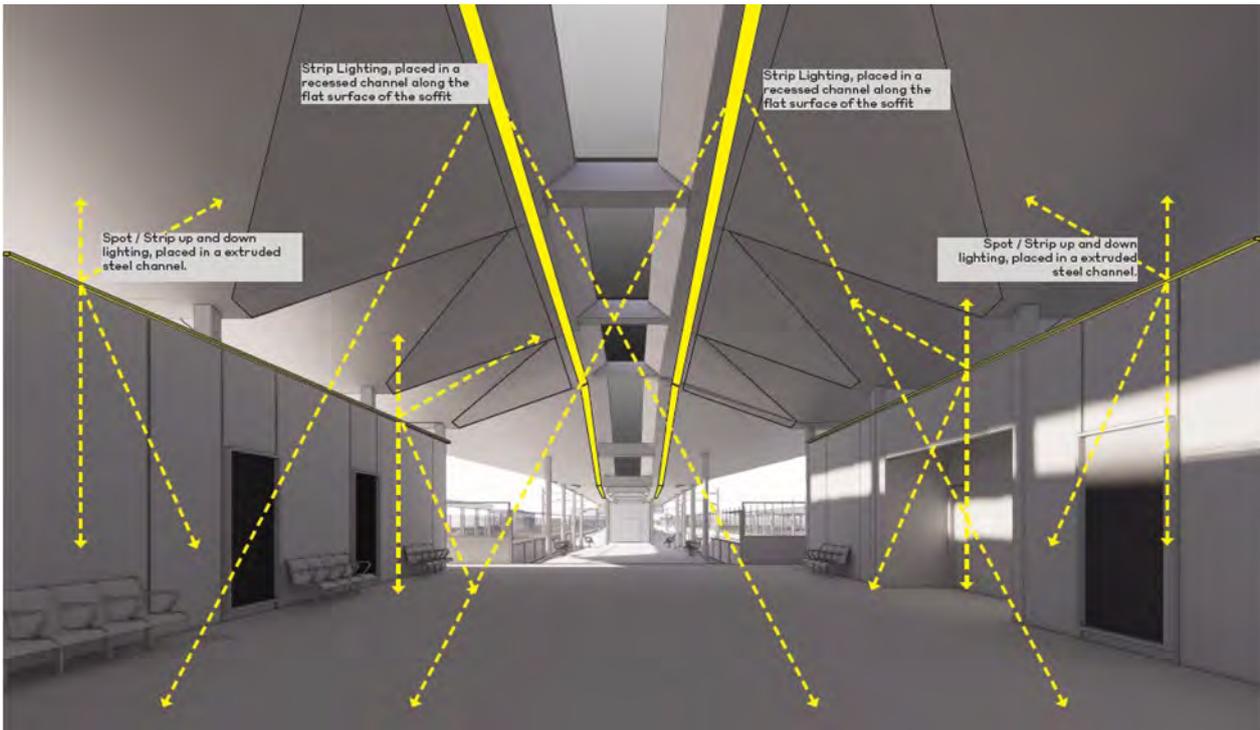
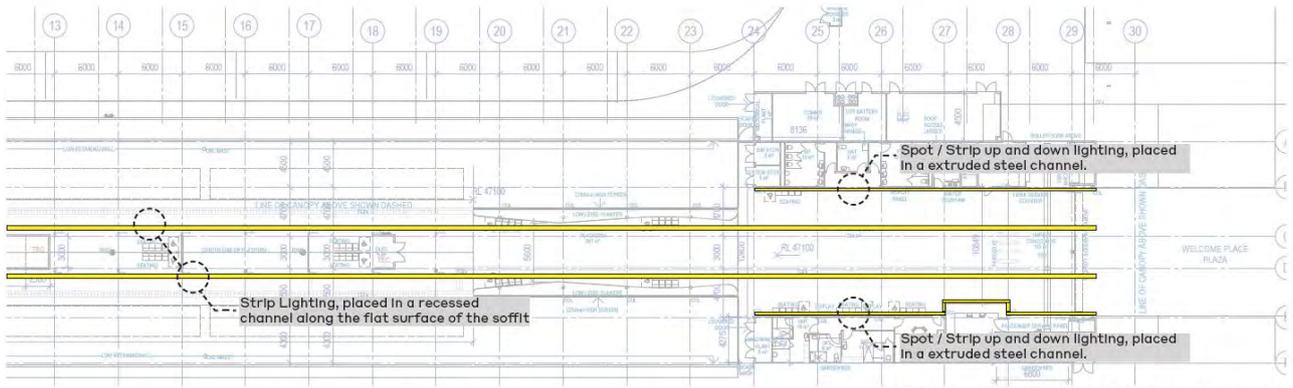
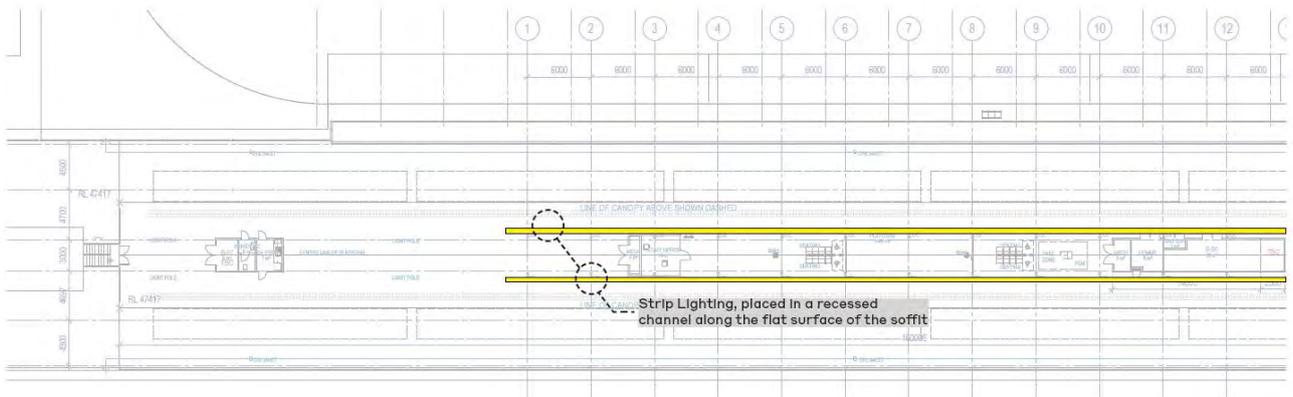


Figure 46: Ellenbrook Station Initial Lighting Strategy



**LIGHTING STRATEGY - ELLENBROOK STATION CONCOUSE**



**LIGHTING STRATEGY - ELLENBROOK STATION PLATFORM**

Figure 47: Ellenbrook Station Initial Lighting Strategy Plan

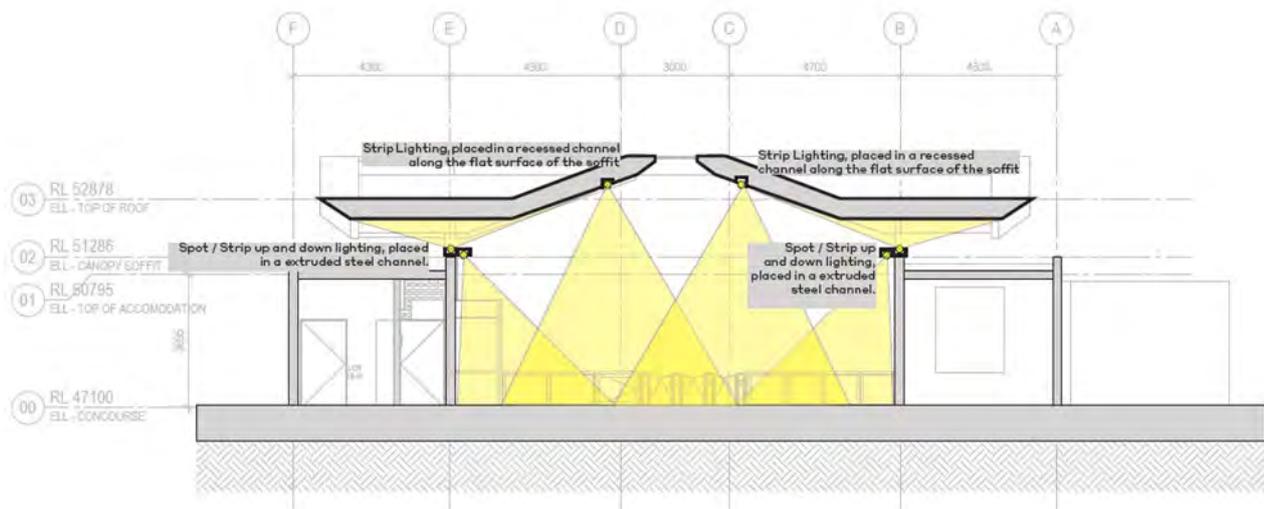


Figure 48: Ellenbrook Station Initial Lighting Strategy Concourse Section

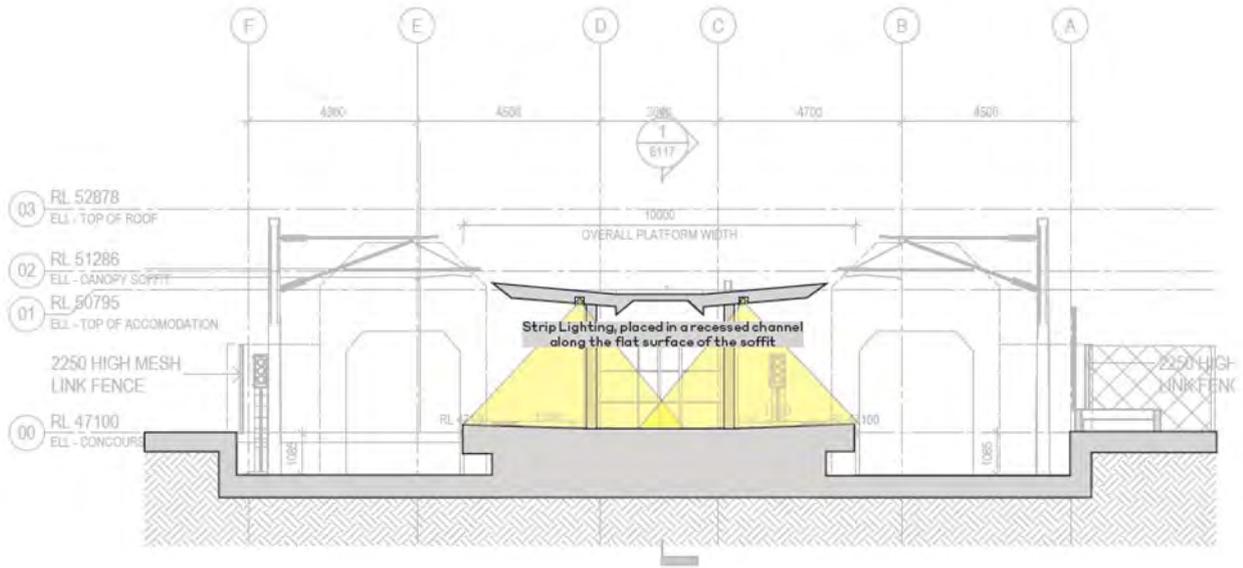


Figure 49: Ellenbrook Station Initial Lighting Strategy Platform Section

### Bus Canopies

Strip lighting will be used to illuminate the area below the canopies

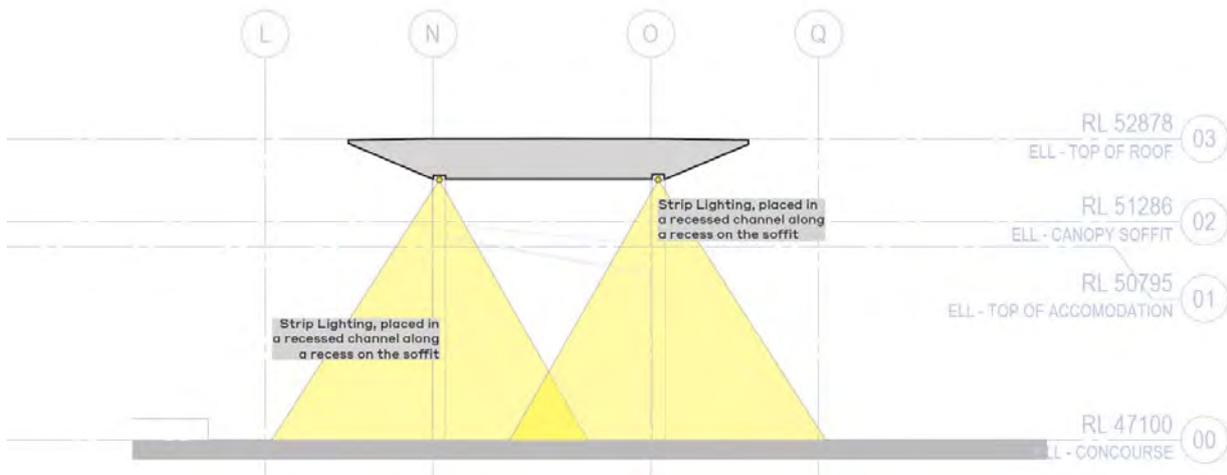


Figure 50: Ellenbrook Station Initial Lighting Strategy – Bus Interchange Entrance

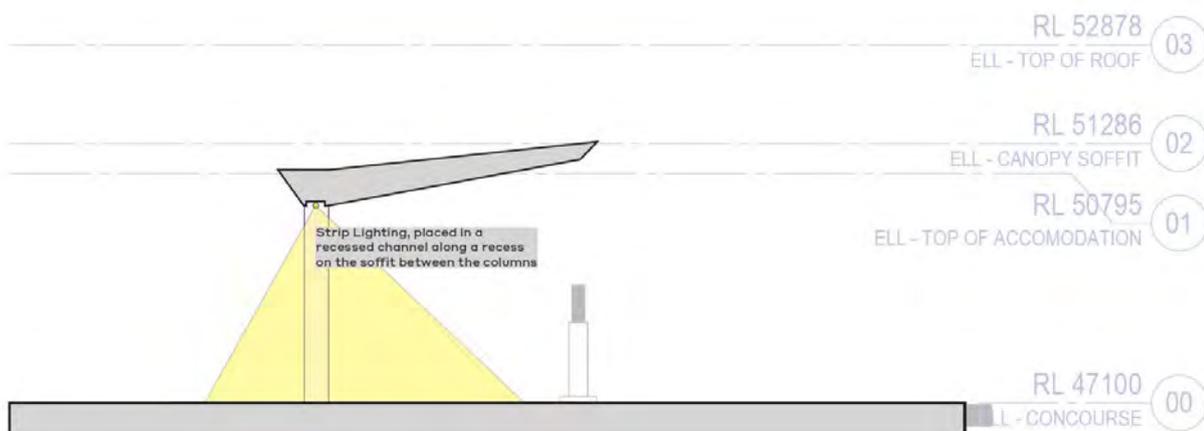


Figure 51: Ellenbrook Station Initial Lighting Strategy

### Precinct

The lighting strategy for Ellenbrook Station aims to utilise a combination of functional and artistic lighting elements to create a safe, welcoming environment. Functional lighting throughout the precinct will provide appropriate visibility across areas such as the large expanse of carparking and the PSP routes. Pole-top lights are being considered for this use.

Within the Welcome Place design, the strategy is to unify functional with artistic lighting elements. This includes strip lighting to the canopy structures, located in between column intervals. Integrated strip lighting to seating walls and terracing steps also provides a level of visibility whilst improving night atmosphere of the Welcome Place.

Other artistic lighting elements outlined in the lighting strategy include in-ground fibre optic lighting within the pavement towards the station entry, and projection lighting to the turf space. There is opportunity to work with artists to develop strategies and stories that can be utilised in these lighting elements. There is also the need to provide lighting to any artworks that are within the space. This will be a part of the public art scope of works and will be worked through with the artist.

It is also noted that there will be no up lighting used throughout the project, based on sustainability guidelines.

The lighting strategy to the Welcome Place and Village Common is illustrated in the following diagram:

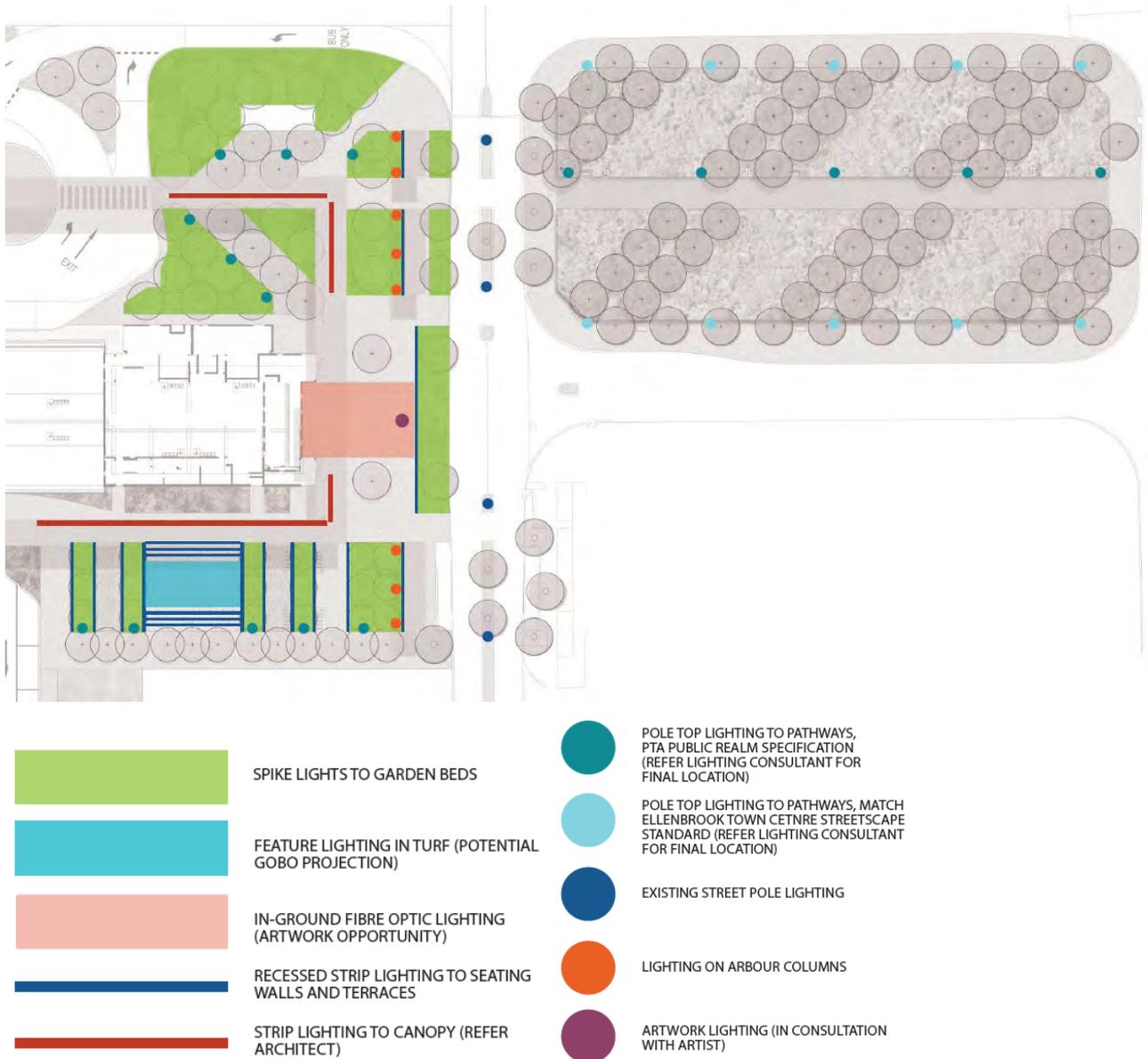


Figure 52: Ellenbrook Station Initial Welcome Place and Village Common Lighting Strategy



SPIKE LIGHTS TO GARDEN BEDS



FEATURE LIGHTING IN TURF (POTENTIAL GOBO PROJECTION)



IN-GROUND FIBRE OPTIC LIGHTING (ARTWORK OPPORTUNITY)



RECESSED STRIP LIGHTING TO SEATING WALLS



POLE TOP LIGHTING TO PATHWAYS AND BASKETBALL COURT (REFER LIGHTING CONSULTANT FOR FINAL LOCATION)



LIGHTING ON ARBOUR COLUMNS



ARTWORK LIGHTING (IN CONSULTATION WITH ARTIST)

Figure 53: Ellenbrook Station Initial Welcome Place and Village Common Lighting Strategy Reference Images

### 3.15 Acoustic Design Strategy

As a strategy, any required acoustic treatments will be integrated within overall wall and / or ceiling assemblies and all materials will be capable of withstanding local weather conditions. Integrated acoustic panels will be placed where required to achieve sound levels as advised by the Acoustic consultant. The team will refer to the Acoustic Consultant's report and recommendations to provide the required acoustic treatments to control reverberation and achieve PA intelligibility for divisions (walls, partitions and roofs), finishes selection and design of specific acoustic treated elements.

### 3.16 Advertising Strategy

The strategy for advertising considers the provision of powered and non-powered advertising in the station buildings, the platforms and bus interchange. The intention is to create intrigue and interest for brands in a place of high transit while keeping it simple, clear and uncluttered to not overwhelm visitors with too much information and without conflicting with wayfinding signage, information panels, public art and security sight lines.

All advertising is to be located and designed to be low maintenance, flexible and easily accessible.

Advertising is moving towards more digital mediums and can also be integrated into information panels.

The next steps will be to discuss the potential advertising locations with PTA and their advertising agents to confirm locations and coordinate service/power connections and detail fixing.

The diagrams below indicate potential locations for advertising highlighted in orange.

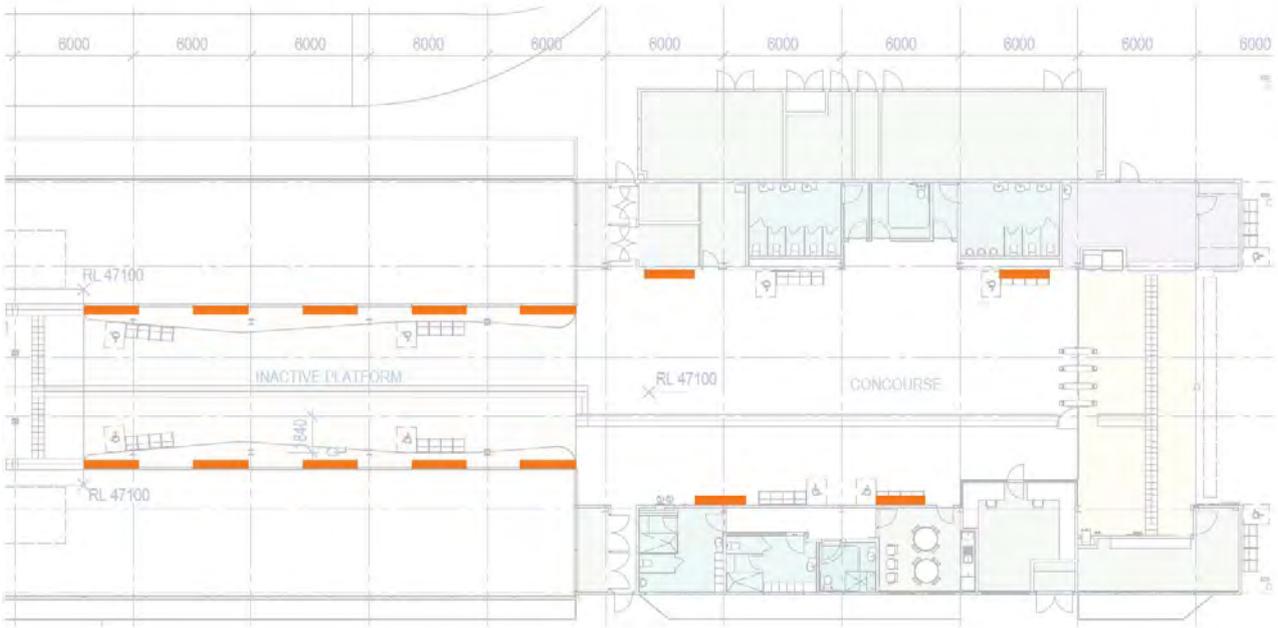


Figure 54: Possible Advertising Locations within Ellenbrook Station Entry and Concourse Area

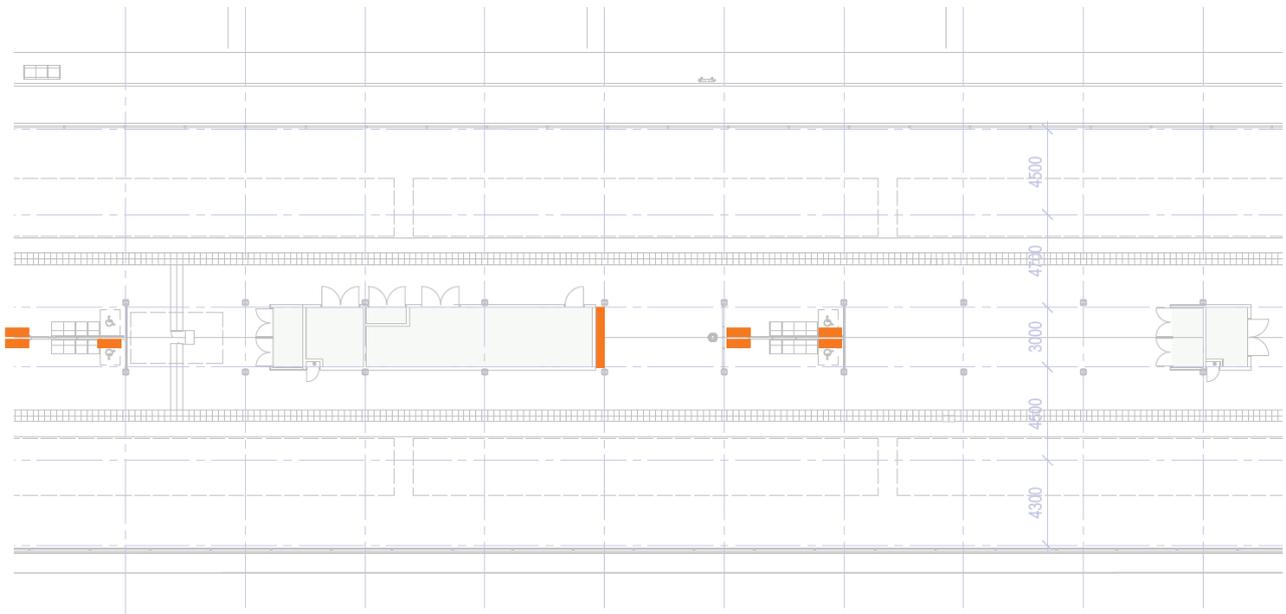


Figure 55: Possible Advertising Locations within Ellenbrook Station Entry and Concourse Area

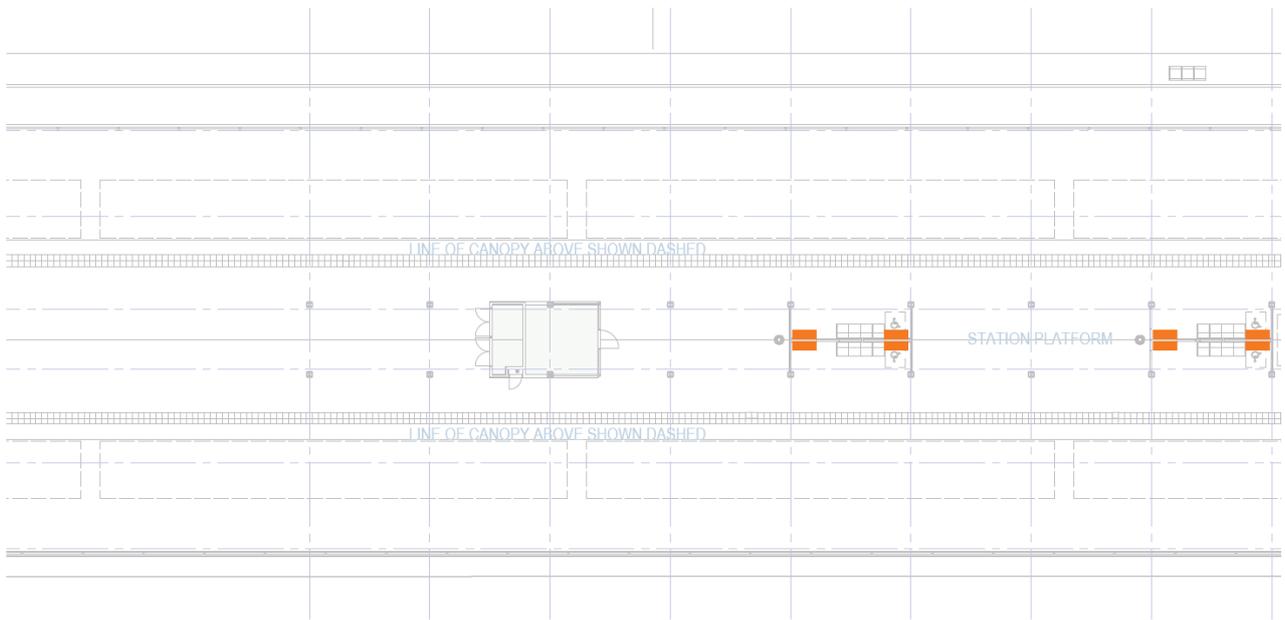


Figure 56: Possible Advertising Locations within Ellenbrook Station Entry and Concourse Area



Figure 57: Artists Impression of Potential Signage Locations at Ellenbrook Station Concourse



Figure 58: Artists Impression of Potential Signage Locations at Ellenbrook Station Platform

### 3.17 Weatherproofing Strategy

The weatherproofing strategy for Ellenbrook Station takes into consideration appropriately located and designed canopies and roof coverage to facilitate natural lighting / solar access, natural ventilation, solar reflection / glare mitigation and provide a level of protection and comfort for users in the areas where these are needed most. Canopies and floating roof coverage at Ellenbrook Station extends over the Station Entrance, Concourse and Platform, providing rain and solar protection while also allowing natural light and cross ventilation. Protection from wind and prevailing wind driven rain at key locations where the roof or canopies may not provide adequate protection have been achieved through the use of solid/glazed vertical screens. Weather protection and cover in the form of canopies, cover the Bus Interchange walkways and waiting areas, the Drop Off / Pick Up waiting areas and motorcycle parking. The bus walkway canopies provide cover all the way to the station entrance.

The design provides canopy 'wings' on either side of the Station Entry, and from here the canopies extend along the walkway to the carpark site and aid with intuitive wayfinding. Adjacent to the Short-Term Parking, canopies cover the universally accessible taxi drop-off zones assisting to prevent hazards and incidents. The progression of the walkway canopy structures merge with the Entry Building roof to provide full protection into the station.

Within the station, cover has been provided to provide protection against wind driven rain and associated runoff to key areas such as the fare-gates, ticketing machines, and a significant portion of the platform. More than 75% of the platform length is covered by roof protection.

#### Station Building

Regulated solar access/natural lighting is achieved through the skylight spine, which runs the length of the station roof. This natural lighting contributes to overall illumination within the station during daylight hours when the station will be most regularly used. Natural ventilation through openings under the 'floating' roof form and perforated screening allows air and temperature regulation throughout the building.

#### Bus Interchange Canopies

Continuous canopies have also been provided to attain continuous and full weather protection to visitors boarding or alighting bus services. Each bus stand, seating and the wayfinding strategy to the station's entry are covered. The Bus Station incorporates seating, shade, lighting and weather protection to ensure travelers comfort and safety. Consideration has been given to waiting places as they will have a significant influence of the ability to spend time pleasantly.

Seating is positioned in the precinct to provide diversity of shade, sun and weather protection. Trees have been planted throughout the precinct to act as wind breaks. They also offer additional protection from the elements as 'natural canopies.' They provide shade to the hot afternoon sun. Storm water run-off and capture is accounted for in the station design, as surface flows will be channeled towards swales at the periphery of the site. Carpark bays do not have kerbs, allowing stormwater to flow directly into the swales.

The following diagrams further outline the weatherproofing solutions and strategies that have informed the design of the Malaga Station at both precinct and station level

Shade and rain cover has been provided within the precinct to the motorcycle parking, the Bus Interchange, the walkways from the Bus Interchange to the station and from the Drop off to the station, as seen in the figure 60

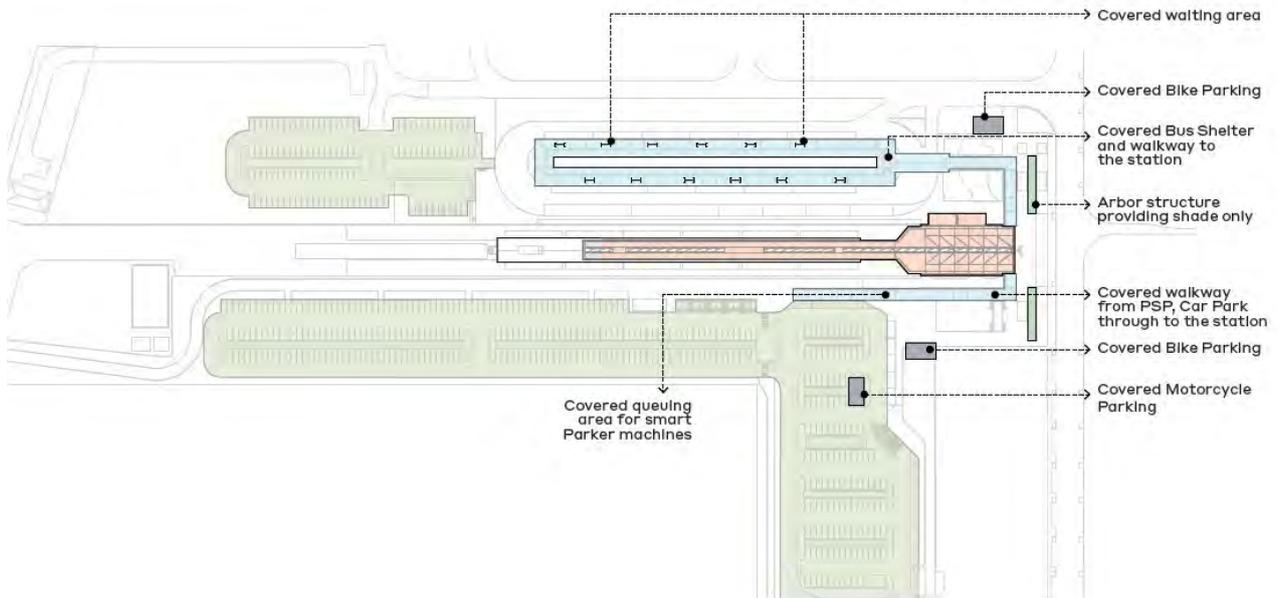


Figure 59: Ellenbrook Precinct Plan – Roof and Canopy Coverage Extent

above.

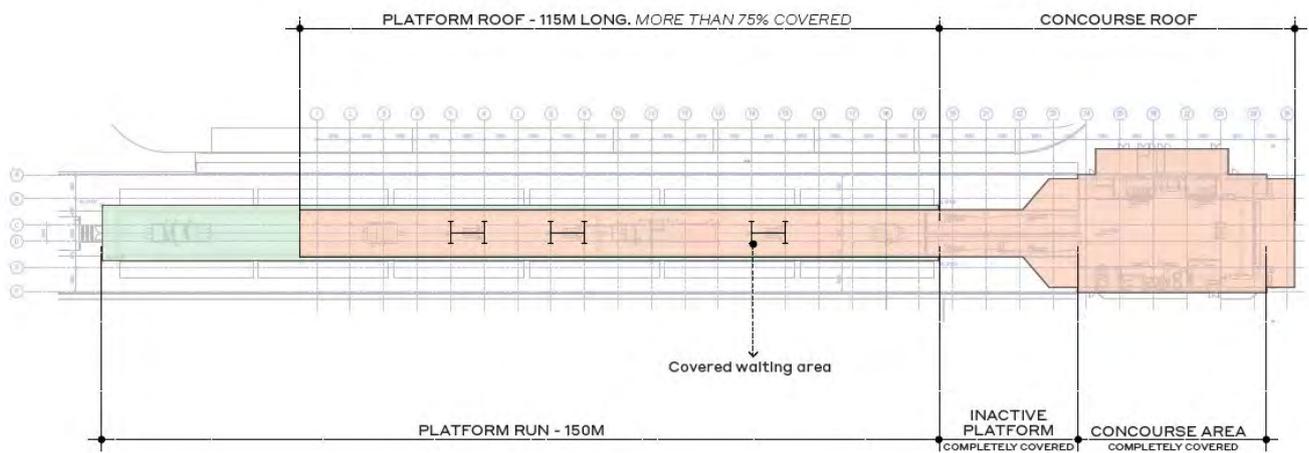


Figure 60: Ellenbrook Station Plan – Roof Coverage Extent

Roof coverage has been designed to meet the minimum SWTC requirements. The non-operational platform and concourse achieve 100% cover and the platform achieves more than 75% cover.

We have tabled the prevailing wind information as provided by the Bureau of Meteorology in the below diagrams.

Precinct Plan Wind Studies

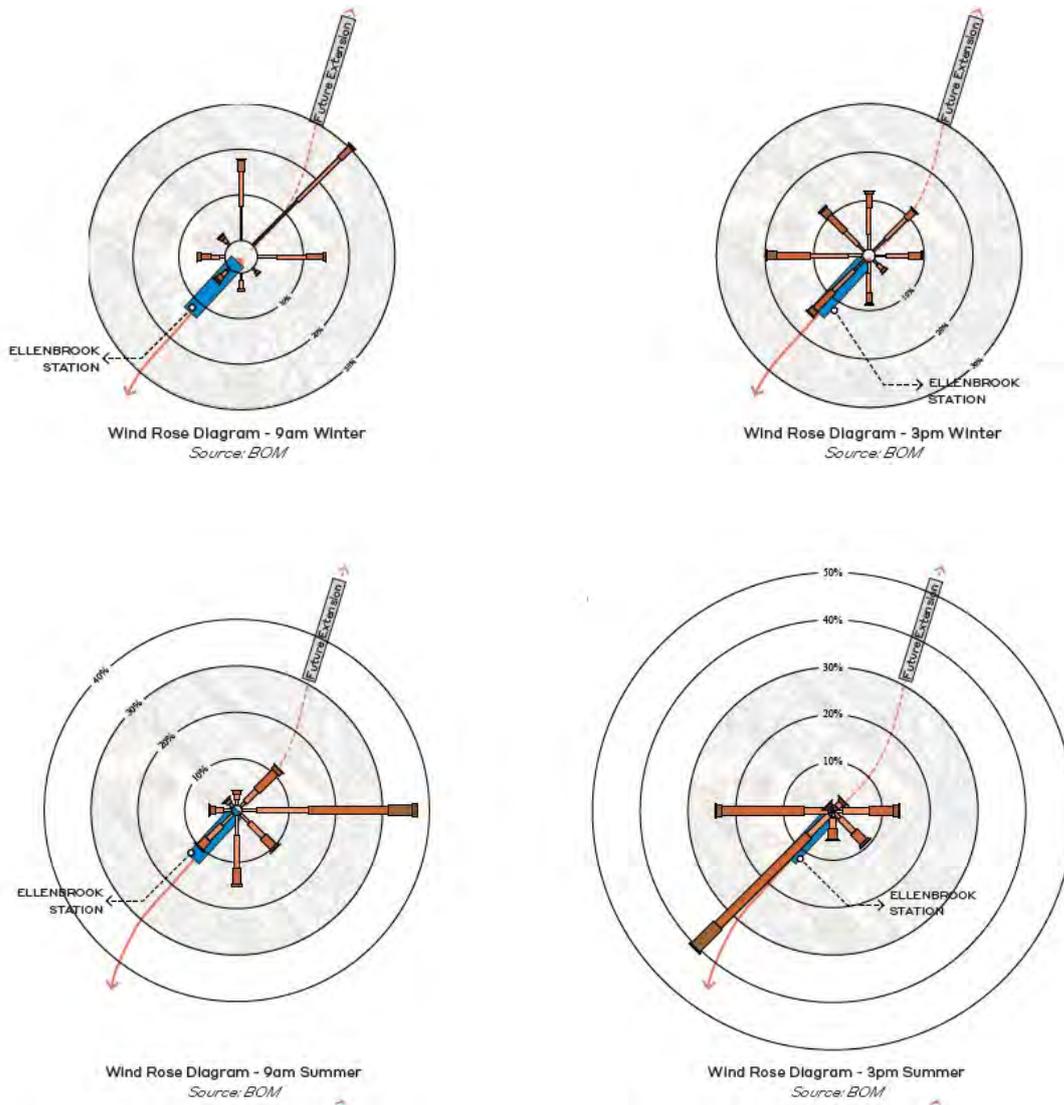


Figure 61: Wind Rose Diagrams illustrating key directional Winds (North to top of page)

While the station has a “floating roof” that provides natural light and natural ventilation into the station, wind driven rain has been considered and tested. Refer to the diagrams below.

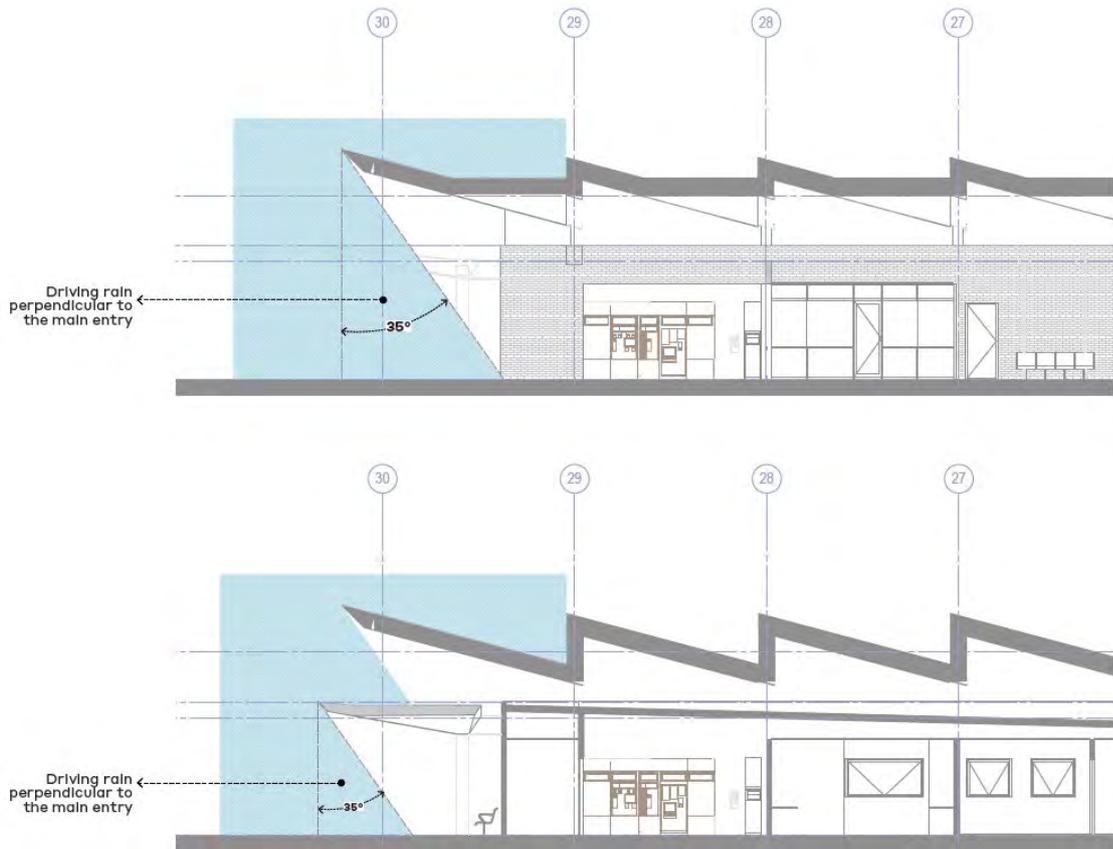
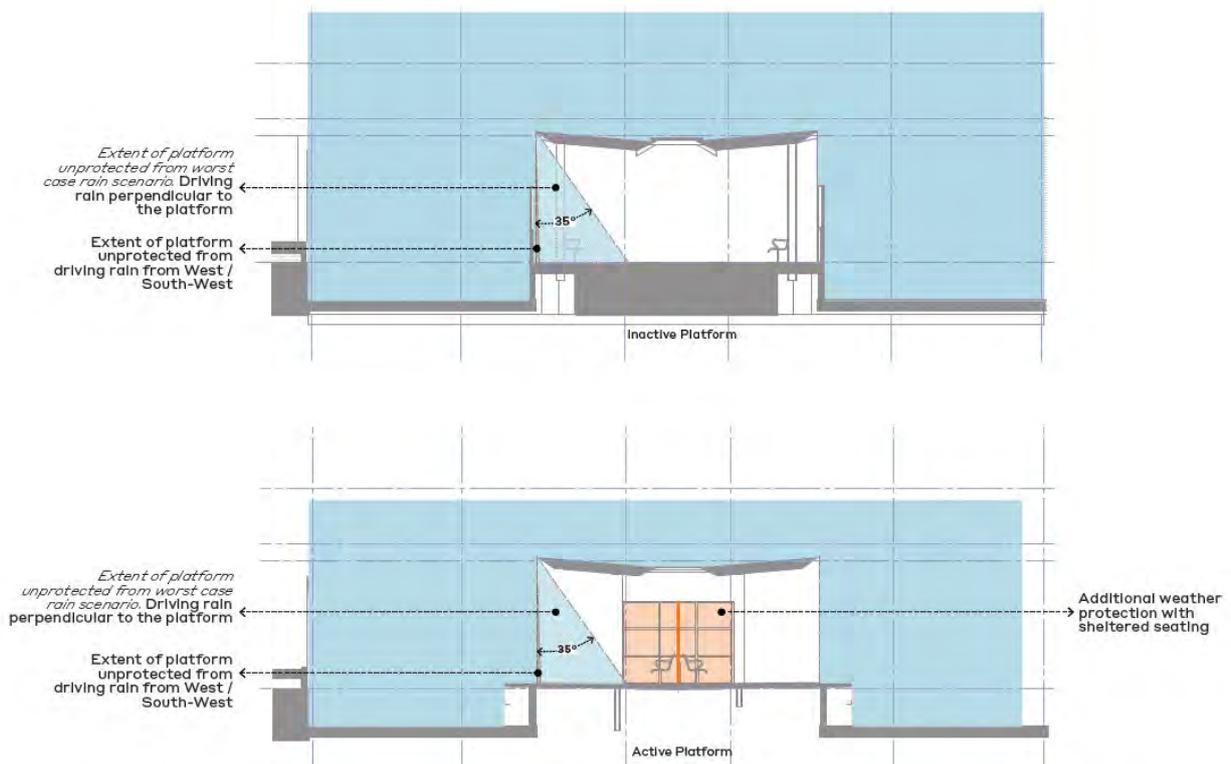


Figure 63: Ellenbrook Driving Rain Studies – Roof Coverage



The rain study diagrams illustrate the effects of wind driven rain on the unprotected extent of the platform (driving rain from West/South-West).

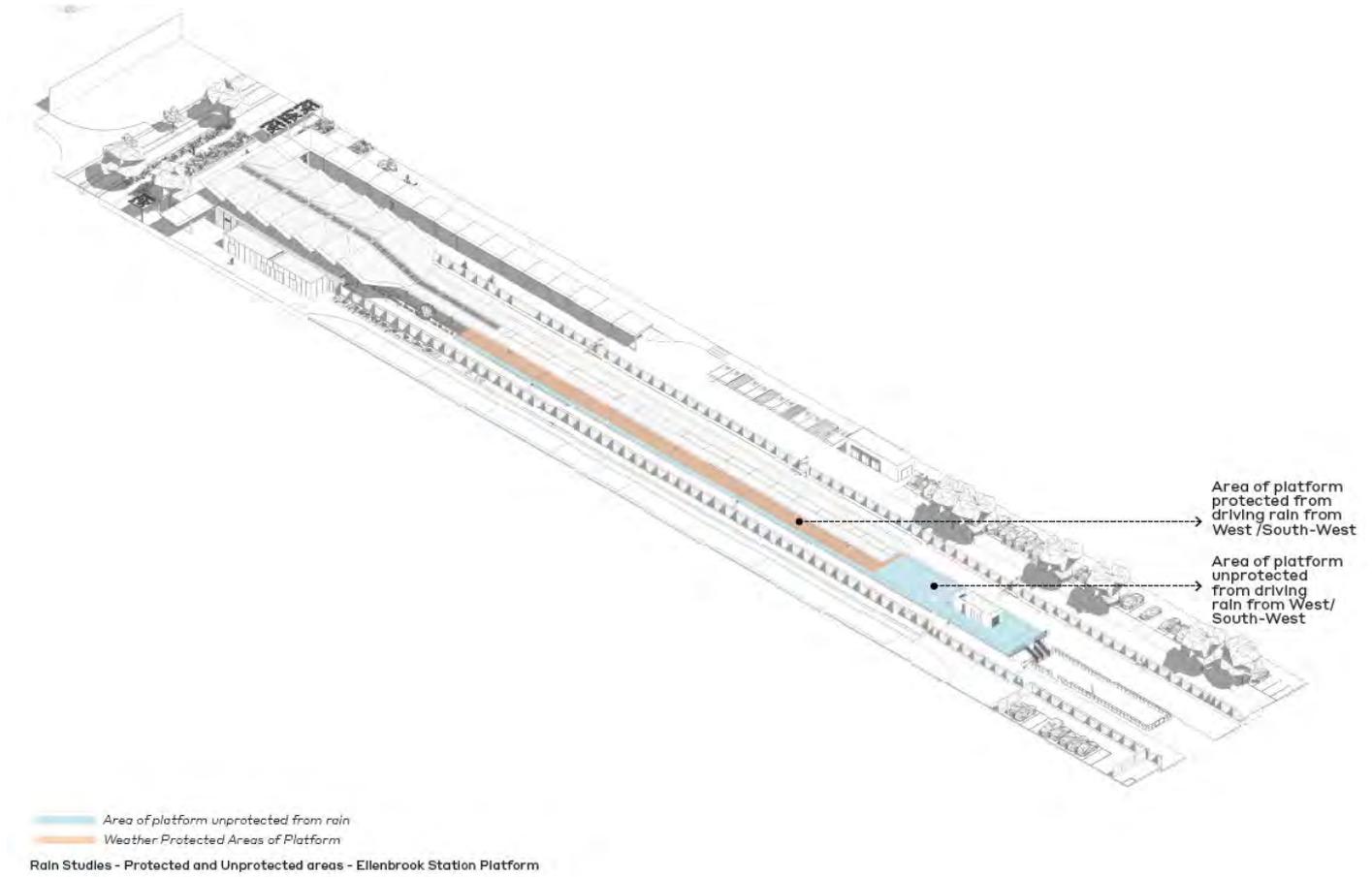


Figure 64: Ellenbrook Rain Studies – Station Platform

Sun studies, in figures 66 and 67, illustrate sun exposure at the time of summer solstice, December 21<sup>st</sup>. The peak transit hours of the station, being between 7am and 9am (8am average) and 4.30pm and 6.30pm (5.30pm average) have been used in the studies of this exposure. The studies show that the concourse entry of the station is well covered from sun exposure, particularly in the key morning hours of transit.

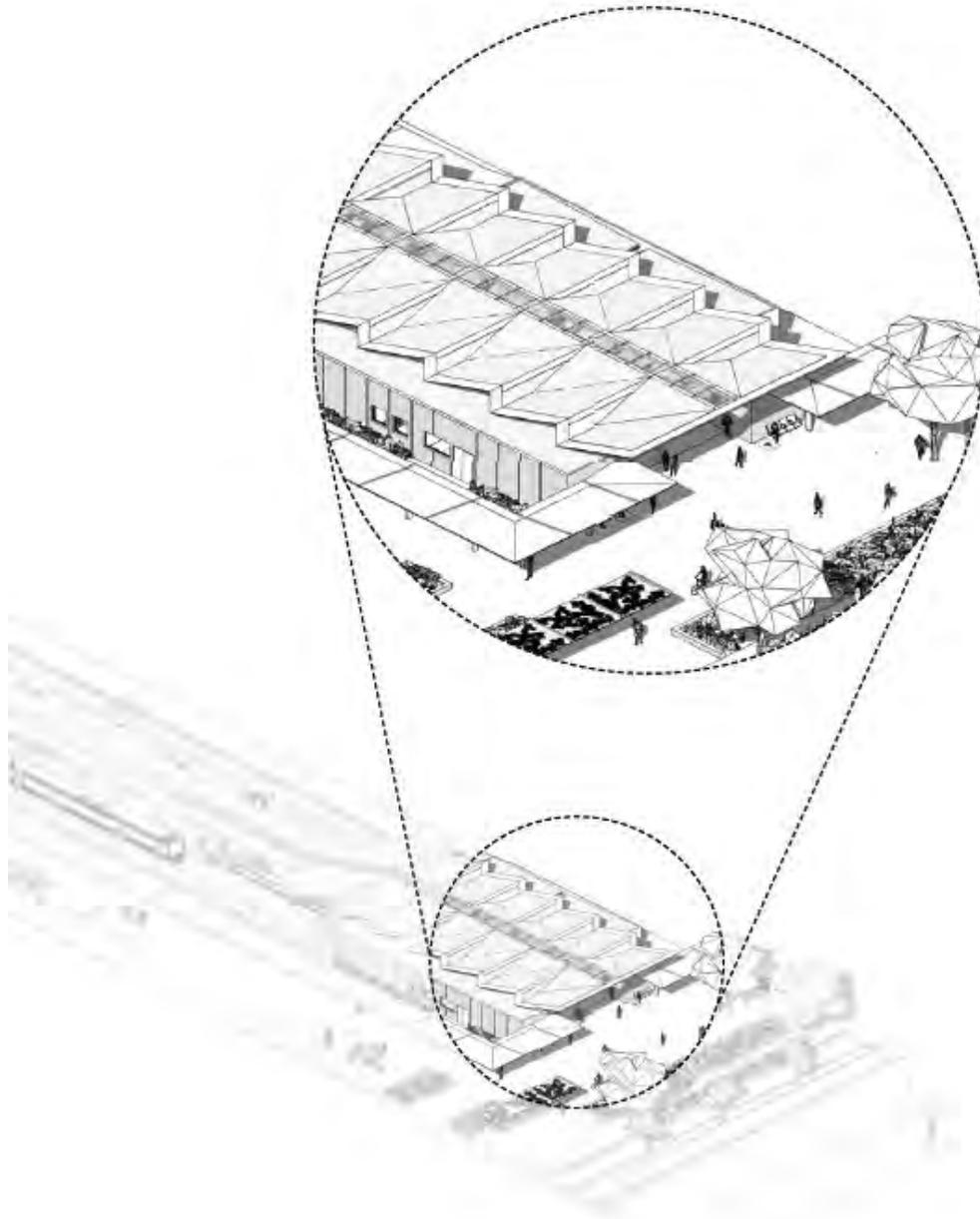


Figure 65: Ellenbrook Sun Studies – Summer Solstice Shading – 8am

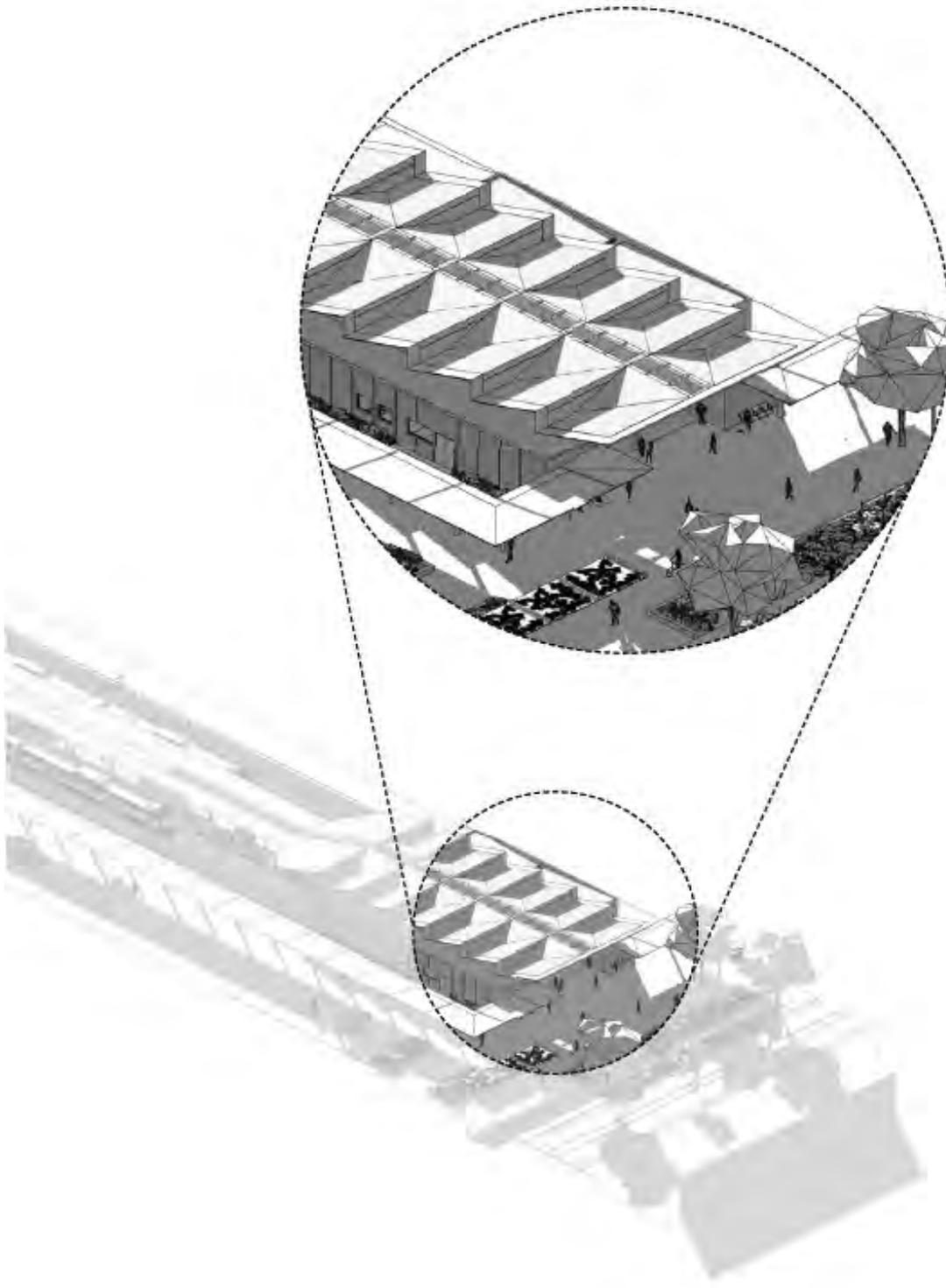


Figure 66: Ellenbrook Sun Studies – Summer Solstice Shading – 4:30pm

### 3.18 Irrigation Strategy

There are several briefing documents that form the irrigation brief for the project, including:

- SWTC Book 3A;
- SWTC Book 4;
- MEL Green Star Owners Project Requirements (doc. ref: MEL-MNO-MET-EN-SPC-0001.1.0.IFI)
- ESD Specification for Green Star Stations
- PTA Specification - Stations and Buildings Landscape Architecture (doc. ref: 8803-000-009.1.0.IFU\_1.0)

Whilst there are number of technical inconsistencies and contradictions raised in this amalgam of briefing documents pertaining to irrigation, the broad unifying intent is to reduce water use for irrigation and minimise the asset maintenance burden for PTA. The identified inconsistencies have been raised with PTA with intent to resolve a clarified set of design requirements that also take into consideration the water supply context for the Ellenbrook station precinct.

Investigations undertaken during Reference Design confirm there is no superficial (surface) aquifer groundwater allocation available to the project. As outlined in the preliminary Irrigation Master Plan Inputs Report (MEL-MLCX-LA-RPT-00007, Appendix HH), there is artesian aquifer allocation available, however due to the depth of the bore required and ancillary infrastructure associated with the groundwater extraction, there are considerable costs associated with utilising a groundwater fed solution.

In addition to this, the Ellenbrook town centre has an established groundwater supplied irrigation network in the vicinity. Several bores in the region feed an irrigation lake located immediately to the south-east of the station precinct in Charlie Gregorini Memorial Park, as shown in the diagram below. Given the proximity of this potential source, discussions are being explored with the town centre developer (LWP) and the City of Swan for the use of the town centre supply to irrigate verge areas and the Village Common (areas which will ultimately be handed over to the local authority, refer zones coloured 'green' on the below diagram).



Figure 67: Irrigation Strategy – Extract from MEL-MLCX-LA-SKT-00007.

In consideration of this, it is proposed that a calibrated strategy using scheme water in a limited capacity be pursued. This solution is proposed on a substantially reduced permanent irrigation footprint and water demand than that contemplated in the SWTC. The area proposed to be permanently irrigated is located in the 'yellow' boundary in the above diagram. The broader establishment irrigation zone is depicted in the 'red' and 'blue' zones. Temporary irrigation in this area is proposed to be turned off after two years from commissioning.

To minimise the potential need for large balance tanks that may be required in the event that the scheme water connection flow rate is below the threshold to irrigate directly off the network at the correct pressure, it is proposed to split the precinct supply into two zones with their own connection point. This will require the create of two lots joined by a contiguous boundary. Each lot will require their own control cabinet. These zones anticipate future development boundaries for the precinct, with scheme connection points proposed in the locations shown

(‘orange’ dots). Due to various site and technical constraints, supplementary balance tanks (above ground), if required are proposed to be sited at locations highlighted by blue dots.

In order to support the minimised use of water for irrigation, the following principles are being applied to the precinct softscape design:

- Careful and maximised selection of (predominantly local native) plant species that avoids reliance on irrigation;
- Attention on soil preparation techniques that encourage plant growth performance in low water environments;
- A reduced area of permanent irrigation as compared with the basic parameters of the initial irrigation brief;
- Hydro-zoning irrigation where it is used; and,
- Utilising sub-surface drip-line irrigation methods (subject to agreement of asset managers).

Detail on the strategy assumptions and infrastructure requirements and sizing are provided in the preliminary Irrigation Master Plan Inputs Report (MEL-MLCX-LA-RPT-00007, Appendix HH). Further development of this strategy to establish stakeholder approval shall be undertaken in the IDDR stage.

### 3.19 Updated Station & Station Precinct Brief Accommodation Schedule

Accommodation Schedule:

Refer to Appendix F of this report.

Room Data Sheets:

Refer to Appendix F of this report.

### 3.20 Future Proofing Strategy and Provisions

The future rail extension from Ellenbrook Station extending northeast of the station has been considered. The station has been located off alignment to provide for future works to have minimal impact on the Ellenbrook Station allowing the station to remain in operation and not be adversely affected by the future rail line extension.

The design of Ellenbrook Station responds to The City of Swan Development Plan of Ellenbrook and its future development provisions/lots. Main Street, The Parkway and The Promenade connect the major elements of the town centre, including the station. The Parkway will emerge as a second main street that connects the town centre to the station precinct. The station and its precinct are to be an anchor point for the new Ellenbrook Town Centre.

The design further accommodates future proofing requirements such as the future expansion provision for carparking located to the north-west of the site and the two bike shelters could expand into their immediate surrounds to cater for any growth in cyclist population.

The services rooms within the station are designed for 30% additional area for future growth and the fare-gate line is adaptable in that more fare-gates can be added to the line. The space on either side of the fare-gate line also allows for additional queuing and pedestrian circulation.

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Figure 68: Diagrammatic Illustration of Future Surrounding Development

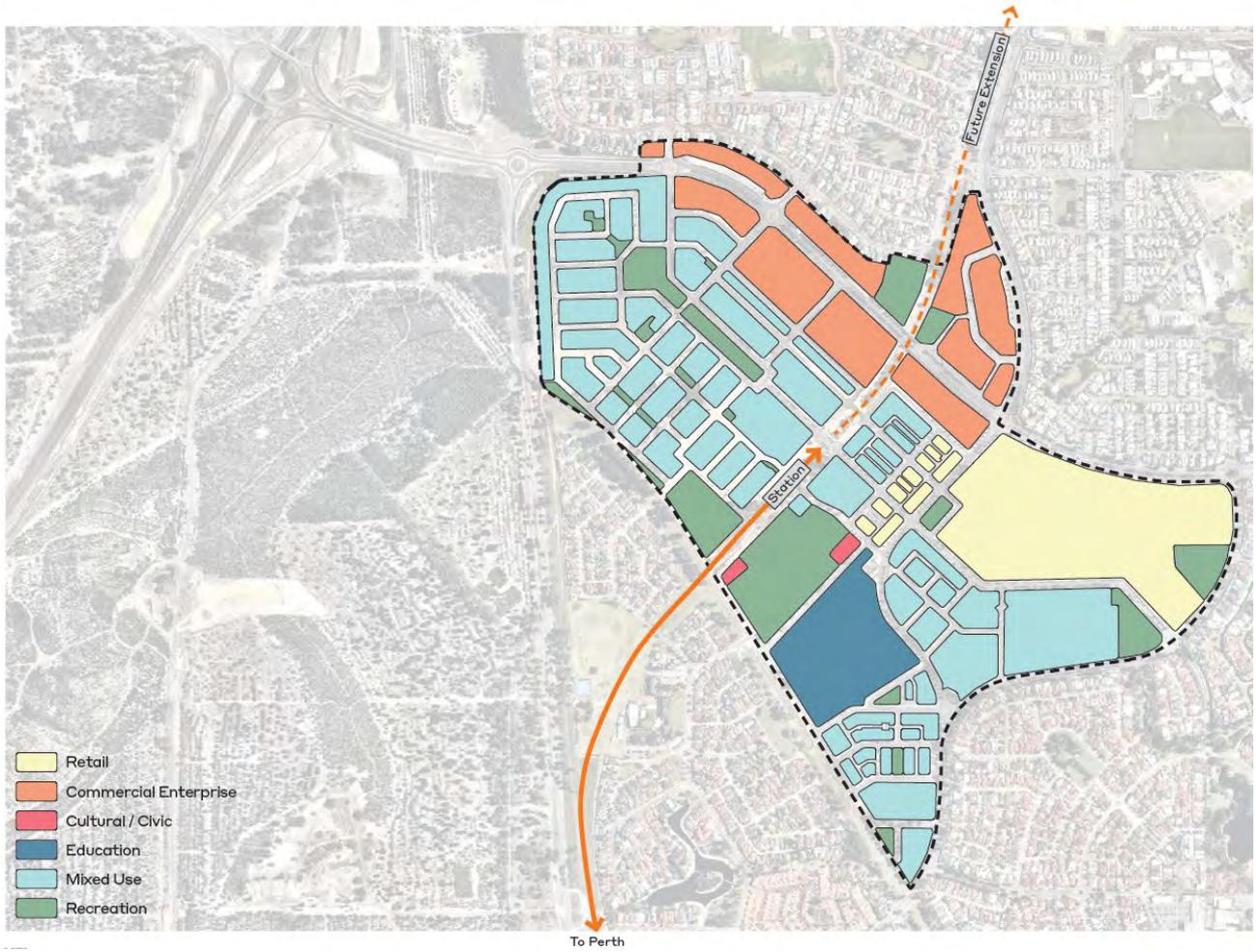


Figure 69: Diagrammatic Illustration of Ellenbrook Development Plan

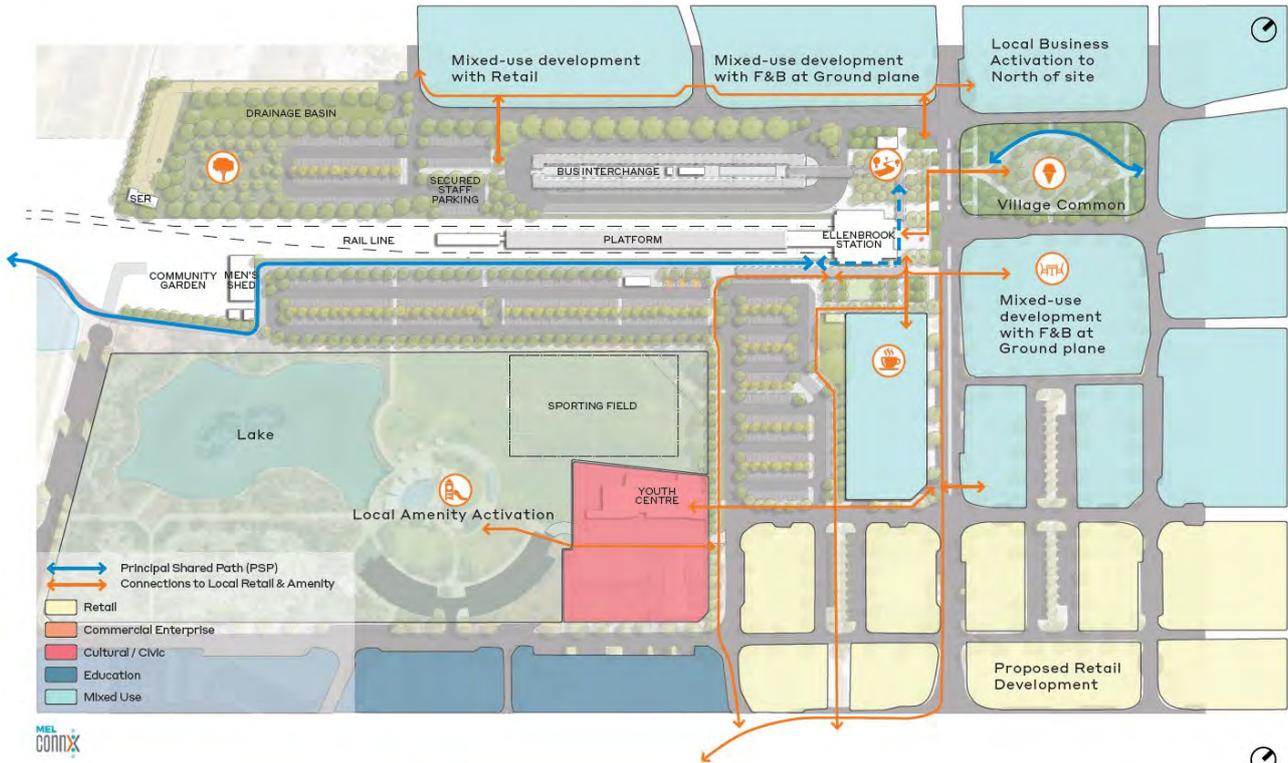


Figure 70: Diagrammatic Illustration of Future Surrounding Development at Ground Plane

### 3.21 External and Internal Material Schedule

External and Internal material schedules for this design package are provided in Appendix F of this report.

### 3.22 Relationship with other Design Packages

The relationship and/or reliance of this design package on other MEL design packages is outlined in the Design Interface Matrix included in Appendix X of this report.

### 3.23 External Interfaces

The relationship and/or reliance of this design package on external interfaces and details of integration strategies are outlined in the Table below.

Item	External Party	Interface Elements	Integration Strategy
1	City of Swan	All aspects of precinct design Village Common - 29/3/2021	Review and implementation of any recommendations where possible.
2	City of Swan – Technical Staff	Project briefing - 18/3/2021	Review and implementation of any recommendations where possible.
3	City of Swan – Elected Members	Project briefing – 26/5/2021	
4	Office of Government Architect (OGA)	Project and Station Design briefing - 10/2/2021	Review and implementation of any recommendations where possible.

5	State Design Review Panel (SDRP)	State Design Review 2 - 9/3/2021 Site Visit – 12/4/2021 State Design Review 3 – 22/4/2021	Review and implementation of any recommendations where possible.
6	Department of Planning Lands and Heritage (DPLH)	Project and Station Design briefing - 23/2/2021	Review and implementation of any recommendations where possible.
7	Metronet Noongar Reference Group	Project and Station Design Briefing – 5/3/2021 Cultural Context interpretation, themes and public art strategy – 4/6/2021	Review and implementation of any recommendations where possible.
8	Metronet Access & Inclusion Reference Group	Cultural Content Station Design briefing – 10/5/2021	Review and implementation of any recommendations where possible.
9	Metronet Precincts	Station precinct and interface with future development – 6/4/2021	Review and implementation of any recommendations where possible.
10	Metronet Art	Cultural Context and Public Art Plan – 14/4/2021	Project Public Art Plan to be consistent with the Metronet Public Art strategy
11	Department of Fire & Emergency Services (DFES)	Project and Station Design briefing - 18/3/2021	Review and implementation of recommendations where possible.
12	Department of Transport (DOT) and Transperth	Project and Station Design briefing - 25/3/2021	Review and implementation of recommendations where possible.

## 4. Design Inputs

### 4.1 Project Design Requirements

The following design inputs have been used in preparation of this report;

#### 4.1.1 SWTC Requirements

Refer to RATM in Appendix O for further commentary against compliance with the SWTC

### 4.2 Design software used for this package

The following design software has been used in preparation of the design.

- Revit
- Enscape
- AutoCAD

### 4.3 Applicable Codes and Standards

The applicable standards, codes and guidelines are in accordance with SWTC Appendix 3. Standards and codes listed in the Table below are those in addition or amended revisions applied to the design.

Reference	Description/Title	Compliance (Specific Provisions, Criteria and Classifications)
<b>Australian and Other Standards and Guidelines</b>		
Nil		
<b>PTA Standards and Specifications</b>		
Nil		

### 4.4 Reference Information

The project specific reference information and reports that have been used as inputs into the development of the design are included in the table below.

Document Reference	Description/Title	Revision
All PTA standards as referenced in SWTC		
WAPC	Designing Out Crime Planning Guidelines	June 2006
Roberts Day Planning Document	Ellenbrook Town Centre Development Plan	Revision D, March 2018

### 4.5 Design Criteria

The design criteria utilised in the development of this design package are outlined below.

*Not applicable*

### 4.6 Design Life

The design life requirements related to this design package are outlined in the Table below. Design life has been estimated on recognised industry guidance.

Item	Asset Element of the Works	Design Life (Years)
1.	Insulation, barriers and water proofing	50 Years

2.	Non-load bearing masonry building elements.	50 years
3.	Artwork, signage and way finding excluding foundations and supporting structures.	20 years
4.	External roof finishes	25 years
5.	External glazing	25 years
6.	External cladding excluding structural elements.	25 years
7.	External furniture and fittings	25 years
8.	External Security/fire gates or doors excluding structural elements.	25 years
9.	Internal non-structural elements - fit out, fixtures and finishes.	20 years
10.	Protective galvanised coatings to steelwork (excluding structural elements).	25 years
11.	Paint finishes to walls.	10 years
12.	Associated support, gantries and other equipment associated with ticketing systems not otherwise supplied by PTA.	30 years
13.	Station public area vertical wall finishes.	50 years
14.	Station public area floor surface finishes.	50 years
15.	Mass concrete (un-reinforced concrete) that does not form part of any structure	50 years
16.	External pedestrian paving (including substrate and paving finish), footpaths, shared paths and hard landscaping features.	25 years

Note: All other assets not described in the table elements shall be on agreement with the PTA to ensure the design life of the asset.

#### 4.7 Durability Requirements

Details of durability issues and risks, and measure to comply with the durability requirements are outlined in Appendix U of this report.

Derived requirements from the Durability Report will be reviewed and actioned in next stage.

#### 4.8 Specialist Technical Inputs

The following specialist technical design documents have provided. Please refer to Appendix DD, Section J Report.

#### 4.9 Constructability Requirements

Details of constructability issues and measures, including traffic management during construction of the Works and the Temporary Works, where this influences design.

#### 4.10 Environmental & Sustainability Design Criteria

The following key environmental & sustainability initiatives have been developed as part of this design package.

Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.

Sustainable landscape and urban design adhere to established water-sensitive urban design principles, minimises negative impacts on existing natural features and ecological processes and facilitates green infrastructure at all project scales.

Passive environmental design measures will be considered at various scales, responding to local climate and site conditions by providing optimal orientation, shading, thermal performance and natural ventilation.

Passive design considerations will reduce reliance on technology for heating and cooling minimizing energy use, resource consumption and operating costs over the life-cycle of the project.

Sustainable products, recycled/reused materials, good waste management practices, re-use of materials and existing structures, harnessing of renewable energy sources, and total water cycle management will be implemented wherever possible.

#### 4.10.1 Energy and Carbon Reduction

Reduction opportunities investigated so far include:

- Improving on thermal properties of the stations building fabric and glass for construction to ensure it is greater than the deemed to satisfy value of the NCC J section will provide operational energy savings
- Prioritising safe walking and cycling routes over other modes of transport around the station precinct especially within the Welcome Place / forecourt to enhance active transport permeability of the station.
- Integration of bike shelters and bike parking hoops within the Welcome Place / forecourts to enhance zero carbon forms of transport to the station.
- Extensive natural light through open floating roof and skylights to reduce reliance on electric lighting
- Low emissions vehicle infrastructure will be investigated in the next design stage.

#### 4.10.2 Water Use Reduction

Water reduction opportunities investigated:

- Selection and specification of water efficient sanitary fixtures to best practice principles
- Incorporation of water efficient landscape irrigation with subsoil drip irrigation and moisture sensor override

#### 4.10.3 Receiving Water Quality Measures

Please refer to Civil and Hydraulic Reports.

#### 4.10.4 Material Use Efficiency

- Use of pre-cut and manufactured standard sized panels.
- Design in tolerances and set-out to minimise cutting and waste
- Use of repeated materials across all stations to minimise waste

#### 4.10.5 Resource Outputs (waste) and Recovery

- The use of waste stream separation bins within the station and platform to industry best practice and Greenstar

#### 4.10.6 Contaminated Sites and Acid Sulfate Soils

Not applicable.

#### Future Adaptability/Deconstruction/Disassembly

Future deconstruction, and disassembly opportunities investigated/implemented to plan for the adaption of the asset as the utilisation and/or infrastructure use requirements change into the future:

- Modular design elements investigated and to be further developed in the next stage.
  - 'Kit of parts' elements repeated across all stations.
-

A project wide climate Change Risk Assessment workshop will be undertaken in June 2021 and any high risks identified will be mitigated through design wherever possible.

#### 4.10.7 Sustainability Labelled Products and Supply Chains

- Flooring, wall treatments, cladding, joinery and loose furniture designed and selected to have a reduced environmental impact.
- Selection of paints adhesives and other materials that minimise the release of indoor air pollutants.
- Incorporating 'Best Environmental Practice' (BEP) PVC products.

~~To~~ Additional opportunities to incorporate sustainably labelled products and materials will be further ~~to~~ investigated and detailed in the next design stage.

#### 4.10.8 Noise and Vibration

Please refer to Appendix II.

#### 4.10.9 Air Quality

- Architectural design provides for open 'floating roof' design providing natural cross ventilation.

#### 4.10.10 Light Pollution Management

- The lighting strategy within the station and precinct looks at using recessed downlighting to minimise light spill.
- Please refer to Specialist Lighting Report by consultant for further management details.

#### 4.10.11 Urban and Landscape Design

The landscape design has taken into account the many different facets of a successful sustainable design.

The sustainability strategy for the landscape design has been developed across the following key elements:

- Reduction of 'Heat Island' – Minimising the amount of hardscape as well as providing shaded canopy to reduce heat island effect where possible.
  - Ecological / Biodiversity Value – The proposed planting palette is structured around predominantly local native species selections which are adapted to the local environment and contribute to enhanced biodiversity outcomes for the precinct.
  - Minimised Maintenance Costs – Local, native plant species have been chosen to minimise maintenance requirements to garden beds through less reliance on irrigation. Hardscape materials and furniture selections based on their robust quality, reliability and ease of replacement.
  - Water Sensitive Urban Design – Swale planting has been included throughout the carpark, implemented in all medians, with the site drainage focused on sending stormwater across the site towards and through these systems.
  - Minimised Irrigation Use - As outlined in section 3.18 (Irrigation Strategy), there is a need to reconcile technical inconsistencies that exist between the various project documents that effectively form the irrigation design brief. Whilst final resolution of the brief is yet to be reached, the unifying intent of the briefing documents is to reduce irrigation water use, with the additional benefit of reducing recurrent infrastructure maintenance costs and energy use from the minimised operation of irrigation plant. It is proposed that minimal irrigation use will be achieved through:
    - Careful and maximised selection of (predominantly local native) plant species that avoids reliance on irrigation;
    - Attention on soil preparation techniques that encourage plant growth performance in low water environments;
    - A reduced area of permanent irrigation as compared with the basic parameters of the initial irrigation brief;
    - Hydro-zoning irrigation where it is used; and,
    - Utilising sub-surface drip-line irrigation methods (subject to agreement of asset managers).
-

- Community Amenity – Provision has been provided for the future community with flexible amenity spaces within the Welcome Place (for example, the open lawn space with water and power sources to allow for events). The precinct design works to create community outcomes such as improved safety and legibility, enhanced areas of green space, and connection to the surrounding residential areas.
  - Further to these key elements, the following initiatives have been included in all aspects of the landscape in order to develop a successful sustainability strategy:
-



### Connectivity

Station incorporate a highly connected network of pathways for all people using all methods of movement.

Integrated initiatives

- Generous pedestrian pathways
- Open, free-flowing public spaces
- Ample parking and storage for all
- Strategic placement of signage and wayfinding



### Amenity

Implement a Public Art Strategy reflecting the rich character and heritage to each station and the overall project. Provide high quality public amenity to users and visitors of all backgrounds.

Integrated initiatives

- Accessible & compliant furniture and amenity
- Engagement of a Public Art Coordinator and Cultural Heritage Design Advisor
- Enhanced canopy coverage



### Resilience & Adaptability

Design that is highly durable and able to withstand the climate of the region as well as the high frequency of foot and vehicle traffic at each Station precinct.

Integrated initiatives

- Hardy, drought tolerant planting
- Durable materials, furniture and planting.



### Biodiversity

Incorporating a range of plant species native to the site and surrounding region that enhance flora and fauna biodiversity.

Integrated initiatives

- Extensive native planting palette
- Species that attract beneficial native fauna.



### Water

Designs to reflect water sensitive urban design through swale design and use of waterwise plant species and efficient irrigation design.

Integrated initiatives

- Extensive carpark drainage swales
- Hardy, drought tolerant planting species
- Mostly non-irrigated garden beds



### Waste

Opportunity to salvage materials from site to minimise imported materials and maintain the local vernacular where possible across all stations.

Integrated initiatives

- Salvaging fallen trees for timber to use as informal furniture elements etc.
- Stockpile of site mulch and topsoils for re-spreading to landscape areas where suitable



### Environment

Ensure environmental values are kept as a primary focus and inform design for each Station precinct and the overall project.

Integrated initiatives

- Hardy, drought tolerant planting
- Maximised tree canopy
- Local planting species



### Local

Using local sub-consultants, suppliers etc where possible to engage local community and to boost local economies.

Integrated initiatives

- Local tree procurement strategies
- Engagement of local Cultural Heritage Design Advisor
- Public Art opportunities
- Material (WA brick) and plant selection.

Figure 71: Sustainable Urban Design Features

The landscape design and contributes to the cultural engagement component of the sustainability strategy both through the design process and ultimately the design proposals themselves. Whilst in the early stages of the process, the MELconnx design team is working with aboriginal representatives as part of the commitment to the Gnarla Biddi strategy to develop proposals that will infuse the landscape, architectural and urban design response of the project. This process is formalised through regular Aboriginal Engagement and Participation workshops, drawing from the Morley-Ellenbrook Cultural Context Report with the intent to develop specific proposals (currently conceptual and work-in-progress) to incorporate into each station precinct. The framework for the engagement is as follows:

- Listen first;
- Continue the conversation;
- Interpret themes holistically;
- Correct and appropriate acknowledgement

Currently, cultural inputs are being explored to inform, influence and ultimately integrate into and throughout the urban and landscape design. Initiatives and proposals currently deployed or being explored include:

Noongar Cultural Recognition:

- Aboriginal Cultural Awareness Training for all participants on the project;
- Smoking ceremony on-site before commencing any work at the site;

Cultural input into placemaking/design:

- Language
- Sharing knowledge and/or stories via QR codes and other digital media
- Traditional naming or dual naming of spaces
- Wayfinding, signage (e.g. Welcome to Country installed at entries)

Art and Design:

- Sculpture
- Mural/wall installation
- Functional elements (seating, shade canopies)
- Cultural heritage mapping
- Gardens
- Meeting places
- Using natural/local materials

Planting:

- Bush foods, medicines
- Approved culturally significant species
- Traditional uses
- Seasonal fruit and flower
- Totemic species
- Naming plaques

As yet, the process of distilling design ideas is in the early development stages and it is anticipated this will be substantially progressed into detailed proposals as part of the next design stage.

#### 4.10.12 Innovations and Opportunities

- Opportunity to provide for future electrical car charging stations and potentially increase the number of these.

#### 4.10.13 Design Decisions

Key design decisions deployed during Reference Design to enhance the sustainability of the stations and precinct include:

- The 'kit-of-parts' approach to key architectural elements to drive material efficiencies in fabrication;
  - Use of local materials that are durable and low maintenance such as face brick;
  - The use of skylights to promote natural light into the station;
-

- The use of a 'floating roof' for natural light and ventilation;
- Safe, welcoming and socially inclusive station design;
- The extensive use of native trees and planting;
- Careful consideration of active transport amenity to support a precinct that encourages the option of walking or cycling to the station;
- Ample provision of shelters and canopies, combined with a generous tree provision to provide comfortable shaded areas for people whilst mitigating heat island impacts.

#### 4.11 Value Engineering

A Value Engineering Optimisation workshop has been completed. The outcomes of this workshop are summarised as follows:

- Reduced skylight width
- Reduced extent of skylights
- Walkway canopy design refined to reduce steel member sizes

#### 4.12 Third Party Operational Stakeholders

The following key Third Party Operational Stakeholders requirements have been developed as part of this design package:

Not applicable

For further information on third party requirements, refer to the RATM extract for this design package contained in Appendix O.

#### 4.13 Design Input from Stakeholders and Community Involvement Process

Please refer to Appendix FF: 'The Architectural and Urban Design Justification Reports' for detailed input from stakeholders and community consultation. The design inputs from Stakeholders and local Community are detailed in the following sub-sections:

##### 4.13.1 Stakeholder Requirements Register

Please refer to Appendix FF.

##### 4.13.2 Community Involvement Process Input

ID	Stakeholder / Community Group	Purpose and Content	Time and Location
1	Ellenbrook CRG	<a href="https://www.metronet.wa.gov.au/projects/morley-ellenbrook-line#project-documents">https://www.metronet.wa.gov.au/projects/morley-ellenbrook-line#project-documents</a>	16 March 2021
2	Ellenbrook Christian College Parents	Project briefing	30 March 2021
3	Ellenbrook CRG	<a href="https://www.metronet.wa.gov.au/projects/morley-ellenbrook-line#project-documents">https://www.metronet.wa.gov.au/projects/morley-ellenbrook-line#project-documents</a>	1 June 2021

#### 4.14 Design Assumptions, Dependencies, and Constraints (ADC's)

Details of design assumptions, dependencies, and constraints are outlined in the following sub-section.

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#### 4.14.1 Design Assumptions

Design assumptions related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
1	All property is within the property boundary including BMX track.	Ongoing	
2	Property development boundary line can be moved to facilitate the designed parking area to the south-east of the station.	Ongoing	
3	SDRP review comments can be addressed to get DA approval.	Ongoing	
4	The Men's Shed is to remain in its current location, however will have amended access through Community Garden.	Ongoing	
5	Future commercial development lot boundary extent can be shifted to the south-east to increase Welcome Place width.	Ongoing	
6	The town centre irrigation water supply will be available to access for the purpose of irrigating verges and recreational areas (e.g. Charlie Gregorini Memorial Park interface, Village Common) that will be handed over to the City of Swan in the future. This will reduce pressure on the proposed scheme water supply for irrigating precincts. Alternative contingency irrigation water sources can be developed, though incur increased cost and maintenance burden.	Ongoing	
7	The irrigation requirements of the SWTC can be reconsidered to resolve technical inconsistencies that exist between the various project briefing documents and to lead to improved sustainability outcomes.	Ongoing	
8	The use of scheme water for irrigation will be approved by the relevant authorities. This proposed approach is subject to confirmation and requires further development in the next phase of design.	Ongoing	
9	The current Welcome Place and Village Common design proposals assume that no traffic lights are required at the intersection of The Parkway and Cussington Road. Should traffic lights be introduced, it may require the reconsideration of the public realm design in these areas to relocate / realign the current proposed PSP alignment to from its current central position to one that delivers pedestrians and cyclists to the signalised intersection.	Ongoing	
10	The current Village Common proposals are based on stakeholder engagement inputs received from the City of Swan and Ellenbrook town centre developer, LWP. They represent a departure from both the Place Plans	Ongoing	

	and the SWTC, resulting in a simpler transit-oriented landscape approach rather than public realm destination.		
11	As outlined in Design Justification Report, the Welcome Place design assumes Food Trucks will be encouraged to activate the proposed Youth Centre precinct rather than the Welcome Place and Village Common due to the better agglomeration of compatible uses and safe vehicle access zones in Charlie Gregorini Memorial Park.	Ongoing	
12	Future asset maintenance capacity and capability will be afforded in line with the standards anticipated in the Place Plans.	Ongoing	

#### 4.14.2 Design Dependencies

Design dependencies related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
1	Future Masterplan	Ongoing	
2	Ground water levels	Ongoing	
3	Future town centre services design being made available for the currently unconstructed verges to the proposed Village Common (i.e. Transit Way and Cussington Road connections between The Parkway and Ellen Stirling Blvd).	Ongoing	
4	Confirmation of town centre development scheme water network flow rates and/or groundwater yield and water quality being of sufficient standard to service precinct irrigation requirements.	Ongoing	
5	The sensible agreement of asset ownership and maintenance boundaries to enable clear and logical demarcation of precinct interfaces, for instance resolving the angled boundary that clips the NW corner of Charlie Gregorini Memorial Park so that land not required for the PTA Park and Ride can instead contribute to community public realm whilst making demarcation of maintenance responsibilities easier and more logical.	Ongoing	
6	To avoid the need for irrigation balance tanks, the irrigation strategy assumes that two lots can be created within the precinct to secure two separate water meter connections, refer Section 3.18. The feasibility of doing this requires consideration of other services operating in the same area which may be impacted by the creation of separate property titles. In the event it is unfeasible, the addition of balance tanks to support a single scheme water connection for irrigation will be required. The detail design for irrigation will be developed and resolved in the IDDR stage.	Ongoing	

7	The Village Common earthworks 'sump' being filled to achieve suitable levels for safety and to facilitate the delivery of the Village Common landscape design.	Ongoing	
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#### 4.14.3 Design Constraints

Design constraints related to this design package are detailed in the Table below;

ID	Description	Status	Evidence of Validation
1	Irrigation swales to east and west of the rail corridor will be built in part by the City of Swan before construction of the station precinct.	Ongoing	
2	The clarification of future asset maintenance boundaries between the PTA and City of Swan – (this impacts certain design and material specifications owing to considerations of operations preferences and maintenance standards.	Ongoing	
3	The reticulation of the PSP along the eastern edge of the rail reserve enforces spatial constraints on the car park and bike store locations that could be optimised with an alternative	Ongoing	
4	The location Men's Shed significantly compromises the configuration of the eastern car park as well as complicating pedestrian and cycle route connections to the broader town centre network.	Ongoing	

#### 4.15 **Requests for Information (RFI)**

Requests for information submitted in relation to this design package are outlined in the Table below. Copies of the RFIs are provided in Appendix W of this report.

RFI REFERENCE	DESCRIPTION	STATUS
MELD-MLCX-RFI-00115	RFI - Tenancy Space Minimum internal Height Requirement	Closed
MELD-MLCX-RFI-00070	RFI - Stations Parking Vending Machines	Closed
MELD-MLCX-RFI-00048	RFI - PTA Room Data Sheet Template/Requirements	Closed
MELD-MLCX-RFI-00039	RFI - Youth Centre Site Plan Native File Request	Closed
MELD-MLCX-RFI-00032	RFI - Ellenbrook Station and adjacent Men's Shed and Gardens	Closed

MELD-MLCX-RFI-00025	RFI - Aerial Imagery Updates	Closed
MELD-MLCX-RFI-00024	RFI - PTA RFI - Xref naming exemption from PTA Standard 8110-300-001	Closed
MELD-MLCX-RFI-00019	RFI - Review Requirements - Amended Scope for Independent Verification	Closed
MELD-MLCX-RFI-00015	RFI - Endorsement of model/drawing numbering conventions	Closed

## 5. Design Outputs

### 5.1 Deliverables List

A matrix of all document/ deliverable types required at each design stage associated with this design package are provided in the Table below.

Deliverable	Reference Design	Interim Detailed Design	Final Detailed Design	IFC
Design Report	X	X	X	X
Drawings	X	X	X	X
Specifications		X	X	X
Specialist Reports		X	X	X
Construction Methodologies		X	X	X
Third party approvals			X	X

### 5.2 Drawings and Models

The drawing and model list for this design package is provided in the TIDP in Appendix A of this report.

### 5.3 Specifications

The specification list for this design package are provided in the TIDP in Appendix A of this report.

Not applicable at Reference Design stage

### 5.4 Standard Reference Drawings

The standard drawings which form part of this design package have been summarised in the Table below.

Drawing Number	Description/Title	Revision
	Not applicable	

## 5.5 System Coordination Drawings and Models

The system coordination drawings and models which form part of this design package have been summarised in the Table below (General arrangements and typical cross-sections).

Drawing Number	Description/Title	Revision
25-A-291-AR0015	Site Plan	A
25-A-291-AR0043	GA Floor Plan – Platform – Zone 1	A
25-A-291-AR0044	GA Floor Plan – Platform – Zone 2	A
25-A-291-AR0045	GA Floor Plan – Platform – Zone 3	A
25-A-291-AR0046	GA Floor Plan – Concourse	A
25-A-291-AR0047	Roof Plan – Accommodation	A
25-A-291-AR0048	GA Plan – Roof – Zone 1	A
25-A-291-AR0049	GA Plan – Roof – Zone 2	A
25-A-291-AR0050	GA Plan – Roof – Zone 3	A
25-A-291-AR0051	GA Plan – Roof – Zone 4	A
25-A-291-AR0090	GA Elevations – Elevation 01 – Zone 1 and 2	A
25-A-291-AR0091	GA Elevations – Elevation 01 – Zone 3 and 4	A
25-A-291-AR0092	GA Elevations – Elevation 02 – Zone 1 and 2	A
25-A-291-AR0093	GA Elevations – Elevation 03 – Zone 3 and 4	A
25-A-291-AR0027	Overall Sections – Sheet 01	A
25-A-291-AR0028	Overall Sections – Sheet 02	A

## 5.6 Product /System Approvals

The Type Approvals which form part of this design package have been summarised in the Table below.

Reference No.	Description/Title	Revision
	Not applicable	

## 5.7 Calculations

Calculations are provided in Appendix E of this report.

Not applicable

## 6. Competence for Design

The competence assessments for relevant design personnel has been undertaken and is evidenced in the PTA SRE Appointment form contained in Appendix CC of this report.

## 7. Design Reviews and Certification

### 7.1 Interdisciplinary Design Coordination (IDC) Review

An Interdisciplinary Design Coordination (IDC) review has been carried out as outlined in the Table below

Reference	Design Stage	Description/Scope	Evidence
IDC-001	Reference Design	Ellenbrook Station & Precinct	Refer to Appendix H

### 7.2 IDC Certificate

Design checking has been carried out. An IDC Certificate is provided in Appendix I of this report.

### 7.3 Design Checking and Verification

Design verification has been carried out. Evidence of design checking and verification is provided in Appendix J of this report.

### 7.4 Independent Verification

Not applicable

### 7.5 BCA

A summary of the BCA review undertaken can be found in the BCA report in Appendix L.

### 7.6 DDA

A summary of the BCA review undertaken can be found in the BCA report in Appendix M.

### 7.7 PTA Design Submission Reviews.

Review comments raised in the previous design stage have been responded to and closed out. The comments register is attached in Appendix N of this report.

## 8. Design Compliance

The demonstration of compliance with the requirements of the Project Definition Documents, including any non-conformances of concessions is summarised on the following sections.

### 8.1 Standards & Guidelines

The standards and guidelines relevant to this design package are outlined in Section 4.3. The design has been carried out, checked and verified by competent personnel as outlined in Section 6.

### 8.2 SWTC

Refer to the RATM extract in Appendix O of this report.

### 8.3 Planning & Environmental Approvals

Refer to the RATM extract in Appendix O of this report.

### 8.4 Third Party Requirements

Refer to the RATM extract in Appendix O of this report.

### 8.5 Engineering Change

The following categories of Engineering Change that have been considered for the design development are as follows:

---

- Engineering Change – A novel design solution that is subject to review and approval from PTA through Management of Engineering Process, refer to PTA Procedure 8110-100-014
- Design Departures – A design non-compliance to relevant codes and standards. Will be subject to review and approval from PTA through Management of Engineering Process, refer to PTA Procedure 8110-100-014.
- SWTC Departures – To be discussed and agreed with PTA in the first instance, technical justification required for departure and confirmation of impacts/benefits to the overall Project. Departure to be formalised through the RFI process once agreed in principle.

Engineering changes are summarised in the table below:

Please refer to Appendix D.

ID	Category	Description	Status
	<i>Engineering Change/Design Departure/SWTC Departure</i>		

## 9. External Interface Work Packages

### 9.1 Project Interface Management Plan

A copy of the Project Interface Management Plan has been provided in Appendix X.

## 10. Effects of the Works

The predicted effects of the Works (EOW) in relation to this design package are outlined in the Table below.

ID	Description	Status
<b>Soccer Field</b>	The soccer field, which is approximately 45m by 90m in size, has been relocated due to the Ellenbrook Station design.	Ongoing
<b>BMX Track</b>	The Ellenbrook BMX Track is within the limit of works boundary and has been relocated in the new precinct urban design. The Station carpark to the South of the rail line will replace the current track site.	Ongoing
<b>Community Gardens</b>	Due to functional requirements of the eastern car park and the unfortunate positioning and orientation of the Mens' Shed, the rationale and functional logic of retaining, the Community Garden's in their current location is significantly diminished, and is therefore proposed to be replaced by a native-inspired, six seasons wildflower garden.	Ongoing
<b>Men's Shed</b>	The Men's Shed is within the limit of works and is to remain in its current site within the precinct. Site works, will, however, have some impact on the Shed throughout construction. Some noise pollution is expected to impact the Men's Shed. Access to the	Ongoing

	building has been provided through a Community Garden.	
<b>Places of 'Biddi'</b>	It is recognised that the effects of the rail works will impede upon Noongar land and the pathways of 'Biddi'. The Station precinct is not only an individual place, but it is a part of significant, intricate networks and connections of ecology, knowledge, meaning, health and storytelling. The cultural meaning behind the pathways of Biddi is to follow the weaving of natural systems. The works of the station will follow the conceptual links of Biddi, where possible and appropriate.	Ongoing
<b>Trees</b>	All existing trees (including at least one <i>Nuytsia floribunda</i> ) within the station building footprint, Welcome Place and Park and Ride areas not able to be retained due to the need to fill the site to the level required to create adequate separation from ground water and to ensure surface drainage works.	Ongoing
<b>Modifications to The Parkway</b>	To facilitate the construction of the design for the Welcome Place and Village Common several amendments are required to the constructed road medians and verge paths adjacent to the station in order to optimise crossing points, pedestrian circulation flows. This includes the removal or potential relocation of one existing tree.	Ongoing

## 11. Safety in Design

### 11.1 Overview

Safety in Design is a standard process defined as the integration of hazard identification and risk assessment methods early in the design process to eliminate or minimise the risks of injury throughout the life of the product being designed. It encompasses all design including facilities, hardware, systems, equipment, products, tooling, materials, energy controls, layout and configuration.

By this definition, the designer takes a leading role in the integration of concepts of safety into the design of a product. In brief, this is achieved through progressive development of the Project Hazard Log (PHL). The PHL included in Appendix Y has been filtered to communicate package relevant hazards and controls. Key Safety in Design considerations include the following (listed in order of precedence):

- Eliminating hazards at the source;
- If hazards cannot be eliminated, then a control will be established to reduce the level of risk associated with the hazard in order of a hierarchy of possibilities and controls:
- Substitution of a less hazardous alternative;
- Engineering controls;
- Administrative controls;
- Other control mechanisms; and
- Communicate known controlled and residual risks to affected parties.

## 11.2 Systems Safety Assurance Plan.

The Project Systems Safety Assurance Plan has been developed and will be updated during the various stages of design development. The SSAP includes Goal Structuring Notation (GSN) informing the safety arguments. The purpose of the SSAP is to define methods, activities, management of activities and deliverables required for the Alliance scope of the MEL Project (including design, construction, testing, commissioning, and handover). The intent is to demonstrate that the systems have been designed and constructed with safety hazards mitigated, meeting relevant safety standards and the completed Project can be operated and maintained with an acceptable level of safety by the Rail Operator.

The SSAP describes how the Alliance proposed to produce a design that is safe to construct, operate, maintain and decommission. It identifies:

- Those responsible for safety assurance;
- The process of capturing safety assurance arguments;
- The engineering safety and safety assurance principles to be followed;
- How the principals will be applied during the life cycle of the system;
- How a systematic approach to risk management will be adopted;
- How relevant knowledge will be imparted to designers; and
- How information about hazards and risk control measures are communicated to those who will work with the finished assets.

The scope of the SSAP includes safety assurance associated with the interfaces with the Tonkin Gap and Bayswater Station Projects design but excludes identification of safety assurance processes and deliverables associated with those two Projects.

## 11.3 Compliance with Safety Assurance Plan

The safety objectives of the overall project are to ensure that the design complies with statutory and design requirements, such as relevant standards and codes, and that all safety requirements are incorporated into the design, reducing the risk to "So Far As Is Reasonably Practicable (SFAIRP)".

Safety hazards are being identified and will be managed in accordance with the Alliance Systems Safety Assurance Plan.

## 11.4 Safety Analysis

The SSAP outlines the Hazard Analysis to be conducted during the detailed design stages MEL Project to identify hazards related to interfaces, hazards specific to each sub-system, potential operation and support issues with the proposed designs and any construction specific risks.

A number of hazard analysis workshops will be progressively conducted during the design stages broken down into relevant disciplines and analysis types (combined SHA/IHA, OSHA, Construction) to ensure hazards are effectively identified at the relevant stages as the design progresses.

## 11.5 Safety Argument

The Safety Argument is based on the GSN for the Project and is reported in Safety Assurance Statement No. 3, MEL-MLCX-RS-RPT-00023.

The PHL will be updated at each lifecycle phase of the Project. The hazards for this design package have been risk assessed and allocated to the Design disciplines associated with this design report which will be used to inform important design inputs.

The status of hazards will be identified in the PHL as follows;

- Open
  - Under Review / Design
-

- Transferred to Construction
- Transferred to Operations
- Transferred to Maintenance
- Transfer to Project Risk Register
- Proposed Transfer to Construction
- Proposed Transfer to Operations
- Proposed Transfer to Maintenance
- Closed
- No Longer Applies
- Resolved for Design

Safety engineering controls for this design package are contained with the Project Hazard Log and reported in Safety Assurance Statement Number 03, MEL-MLCX-RS-RPT-00023.

## 11.6 Hazard Analysis

Risk has been assessed against hazards in accordance with the Risk Matrix and Tolerability Criteria in the MEL System Safety Assurance Plan as outlined in the Project Hazard Log (PHL) in Appendix Y of this report.

## 11.7 Satisfaction of Safety Integrity Level Targets

## 11.8 Satisfaction of GSN Requirements

The assurance activities required to fulfil all the relevant GSN to support the safety argument for elements of the following goals, sub-goals and solutions appropriate to this design package are described in the Table below.

Ref	Goal	Evidence

## 11.9 Management of Safety Requirements

Controls identified in the workshops are raw controls that are transferred to relevant design package owners. During hazard identification workshops controls are identified as either to Implement or to Consider. Controls identified as implement are embodied in the design at the current design stage whereas controls to consider may be implemented into the design at some point in the future pending further consideration.

Subsequent to the workshops, as part of the design process, hazard controls have been assessed as either Open, Implemented or Rejected:

- **Open** signifies that implementation is not yet confirmed.
- **Rejected** signifies that the control is not implemented; reasons for rejection recorded at Safety Control Verification Reference column in the PHL.
- **Implemented** signifies that implementation in the current stage design has been confirmed with evidence recorded at Safety Control Verification Reference column in the RATM.

Controls which are Implemented shall be further developed into Derived Safety Requirements which are traced in the RATM in DOORS. These safety requirements shall follow the wording convention of other requirements in the RATM and in addition shall be specific, measurable, relevant and realistic

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## 11.10 Safety Assurance Statement

A Safety Assurance Statement has been produced for this design and is submitted as part of the parent package for this design.

## 11.11 Transfer of Residual Risks and Safety Related Operational Conditions

All hazards which do not have a hazard status of “Hazard Eliminated” refer to residual risk to be transferred either to construction or operation.

Refer to Section 15 for operational phase requirements required to maintain the design integrity of the infrastructure referred to in this Design Package.

In addition, the following Safety Related Operational Conditions identified in the PHL must be met to maintain the design safety integrity of the infrastructure referred to in this Design Package:

## 12. Systems Engineering

### 12.1 Sub-system Allocation

The sub-system (s) related to this design package are:

SBS ID	Title	Level	E013, WOODS BAGOT - Ellenbrook Precinct - Urban Design - Architecture
<b>2</b>	<b>Track &amp; Structures</b>	<b>0</b>	<b>x</b>
<b>2.1</b>	<b>Structures</b>	<b>1</b>	<b>x</b>
2.1.1	Fencing & Barriers	2	x
2.1.2	External Structure	2	x
2.1.3	Back of house	2	x
2.1.4	Building (non-operational)	2	x
2.1.5	Bike Parking Machine	2	x
2.1.8	Rail Depot	2	x
2.1.9	Railway Station	2	x
2.1.11	Parking	2	x
2.1.13	Formation	2	x
2.1.14	Rail Reserve	2	x
2.1.15	Bridge	2	x
2.1.16	Culvert	2	x
2.1.17	Footbridge	2	x
2.1.18	Pedestrian Bridge	2	x
2.1.19	Platform Edge	2	x
2.1.20	Pedestrian Underpass	2	x
2.1.21	Rail Bridge	2	x
2.1.22	Road Bridge	2	x
2.1.23	Tunnel	2	x
2.1.24	Access Stairs and Handrails	2	x
2.1.25	Drainage	2	x
<b>2.2</b>	<b>Track</b>	<b>1</b>	<b>x</b>
2.2.3	Railway Crossings	2	x
2.2.4	Insulated Joint	2	x
2.2.5	Location Case	2	x
2.2.6	Lubricator	2	x
2.2.7	Hardstand	2	x
2.2.8	Slab track	2	x
2.2.9	Sleepers / bearers	2	x

### 12.2 Requirements Management

Requirements management occurs throughout the life cycle of the project and is described in the Systems Requirements Management Plan (RMP). The Requirements Allocation and Traceability Matrix (RATM) has been established and is used to track the requirements from the identification and allocation stages through to verification for contract requirements and derived requirements, such as safety and Human Factors requirements from hazard analysis.

In Reference Design phase, these requirements were allocated to package(s) for demonstrating compliance at agreed points in the project lifecycle. For the Interim and Final Detailed Design phases, the progressive compliance of requirements allocated to this package is shown at Appendix O.

### 12.3 Engineering Assurance Summary

Prior to formal submission of the RD and FDDR for each design package, and to support PMF3 and PMF4 gate approvals, Melconnx shall provide an Engineering Assurance Summary for PTA's review. This is provided to evidence an integrated design approach has been adopted and all Engineering Assurance activities have been completed to the extent required for the specific design stage.

Engineering Assurance documentation to be provided as part of the Engineering Assurance Summary are as follows:

- Scope of Work summary
- Evidence of compliance with Environmental Planning Approvals
- Evidence of Whole of Life sustainability outcomes
- Evidence SWTC and SRS requirements have been met
- Evidence of Stakeholder consultation and approvals where required.
- Evidence of Safety Assurance activities
- Summary of Engineering change approvals
- RAM considerations
- Summary of Assumptions, Dependencies and Constraints.
- Operations and Maintenance Strategy
- Evidence of Design reviews
- Program/Schedule
- Evidence of Human Factors Analysis

## 13. Sustainability in Design

Development and documentation of sustainability initiatives have been determined for this design package and are included in Appendix V of this report.

## 14. Testing & Commissioning Requirements

Inspection and Test Plans (ITP) summarise the requirements of the Specifications and Design Drawings by detailing the criteria for workmanship, verification activities including Witness and Hold Points, and related authorities/responsibilities for each stage of the construction/installation process.

Refer to summary below for specific ITP requirements including Hold Points and Witness Points which will be required to be undertaken as part of the construction phase support activities.

### 14.1 ITP's

Not applicable

### 14.2 Hold Points

Refer to specifications that will be prepared at later design stage

### 14.3 Witness Points

Refer to specifications that will be prepared at later design stage

---

## 15. Human Factors

As outlined in the Human Factors Integration Plan (HFIP) the Design Report will detail the strategies and initiatives to identify, manage and integrate Human Factors (HF) risks and requirements through all phases of the Project.

The purpose of applying the HF process is to ensure human interactions with the system and system elements are well designed through the application of established HF principles and knowledge so that the delivered operational system benefits the end users by:

- Minimising errors
- Improving effectiveness
- Improving user comfort
- Increasing system acceptance.

The Malaga and Ellenbrook stations are currently in the reference design stage. In order to assess the reasonably foreseeable human factors and how they are integrated into the MEL stations, a Process Chart technique has been selected. This is one of candidate HF analytical techniques identified in the MEL HF Integration Plan. The Process Chart is tailored for the station environment by combining the intended flow of people through the station with the tasks and cognitive capabilities needed in their activities.

The topology of the Ellenbrook and Malaga stations are similar to many others on the Perth network. There are no significantly new features or methods in which normal passenger and members of the public are expected to learn or understand how to access and use the MEL.

Notwithstanding the above, the station is a bespoke design, tailored to suit the requirements, assumptions, dependencies and constraints offered by the MEL project.

Ellenbrook station and its precinct offers a single level operations characterized by open and ease of access whether on approach from bus, car or PSP. It has ample space to wait or meet fellow travellers and is embodied with generous green foliage. Intelligent architecture is used to provide intuitive wayfinding and there is ample room for people to congregate or evacuate in the event of unexpected disruptions. There are however, several design areas to be finalized or which present opportunity for further consideration including:

- Pedestrian crossing at bus interchange island to ensure awareness of both passengers and bus drivers of the approach by buses outside the view of typical users
- Access ramps to the elevated green space plinth in Welcome Place
- Detailed assessment of lines of sight for passenger information system screen
- Detailed acoustic analysis of sound and clarity within the concourse and station areas to ensure audio messages can be heard and understood
- Additional information screens at entrance to platforms after the concourse to help passenger flow on and off platforms

**The HF identified and considered is included in the Human Factors Issues Register (HFIR) in Safety Assurance Statement Number 03, MEL-MLCX-RS-RPT-00023.**

## 16. Reliability, Availability and Maintainability (RAM)

### 16.1 General RAM Provisions

RAM has been optimised on this package by the following assessments and design features:

- Durability has been assessed and design life requirements have been met (See Section 4.7)
- Operational Phase requirements have been assessed.
- Maintenance requirements have been assessed and are detailed below:
- Landscape maintenance has been considered in accordance with SWTC Book 4 Technical Criteria (Ref: MEL-PTAWA-PM-RPT-00006), Section 10.7 (landscape maintenance) and PTA Specification Stations and Buildings – Landscape Architecture (Ref: 8803-000-009), Section 6 (Maintenance and Establishment) and the maintenance requirements have been met or are accommodated in the design. Key factors addressed in the design include:

- Nearby maintenance vehicle access is accommodated to all landscape areas either through proximity of adjacent roadways and park bays or through provision of trafficable surfaces (e.g. Welcome Place). Vehicle access to Welcome Place (if required) is supported through secure removable bollards;
- Secure general purpose power outlets and hose-cock connection points are provided in the Welcome Place to facilitate public realm maintenance.
- All furniture selection proposals are based on proprietary supply and are proposed to be sourced from an established, Australian based suppliers who maintain local inventory or minimal supply times, refer landscape material schedule MEL-MLCX-LA-SCH-00001. (The one exception relates to USB Charging Stations, see additional notes below).
- A portable ramp will be required to be provided by the maintenance contractor / operator to facilitate the maintenance of turf area, which is located at the top of some stairs. (The turf lawn is elevated so that it serves as an attractive informal seating destination adjacent to future food and beverage offering. Elevating the lawn protects it from becoming a ground level thoroughfare).

The following items will be addressed in the next design phase:

- Irrigation maintenance strategy – details of irrigation maintenance requirements are pending completion of irrigation design, refer Section 3.18 for further detail. This will be resolved in the next phase of design.
- External USB charging stations (as required in the SWTC) are a relatively new product on the Australian market. As such, there is not enough data to supply chain reliability. This research is continuing and will be updated in the next phase of design.

## 16.2 RAM Targets

RAM targets and RAM analysis related to achieving the 95% On time Running requirement are not applicable to this package. The package scope consists of primarily static items and therefore compliance with design life and durability requirements is considered sufficient.

## 17. Construction Methodology

### 17.1 Construction Methods

The construction methodology and staging has been developed as a 4D sequence as contained within the weekly project federated model (Doc ref: 25-B-00-0001).

### 17.2 Operational Staging

The works associated with this design package will be delivered in one Operational Stage including the following key works;

Not applicable.

### 17.3 Works in Track Occupancies

The following works will be required to be undertaken during track possessions or specific electrical outages;  
Not applicable.

## 18. Asset Maintenance Considerations

The following asset management strategy is required for this design package:

[To be confirmed at the next design stage.](#)

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## 18.1 RTO Assets

## 18.2 Other Assets

The following additional asset operational requirements are applicable to this design package as identified below:

# 19. Asset Operations Considerations

The following operational strategy has been assumed in this design package:

To be confirmed at the next design stage.

## 19.1 Normal Modes of Operations

## 19.2 Degraded Modes of Operations

# 20. Decommissioning Strategy

A decommissioning review, including a decommissioning methodology and staging review has been undertaken to identify any restrictions on the assets capability to be modified, and or decommissioned on final completion of the Works (following transfer to the final asset owner).

Not applicable

## 20.1 Capability to Modify

## 20.2 Decommissioning Strategy

Not applicable

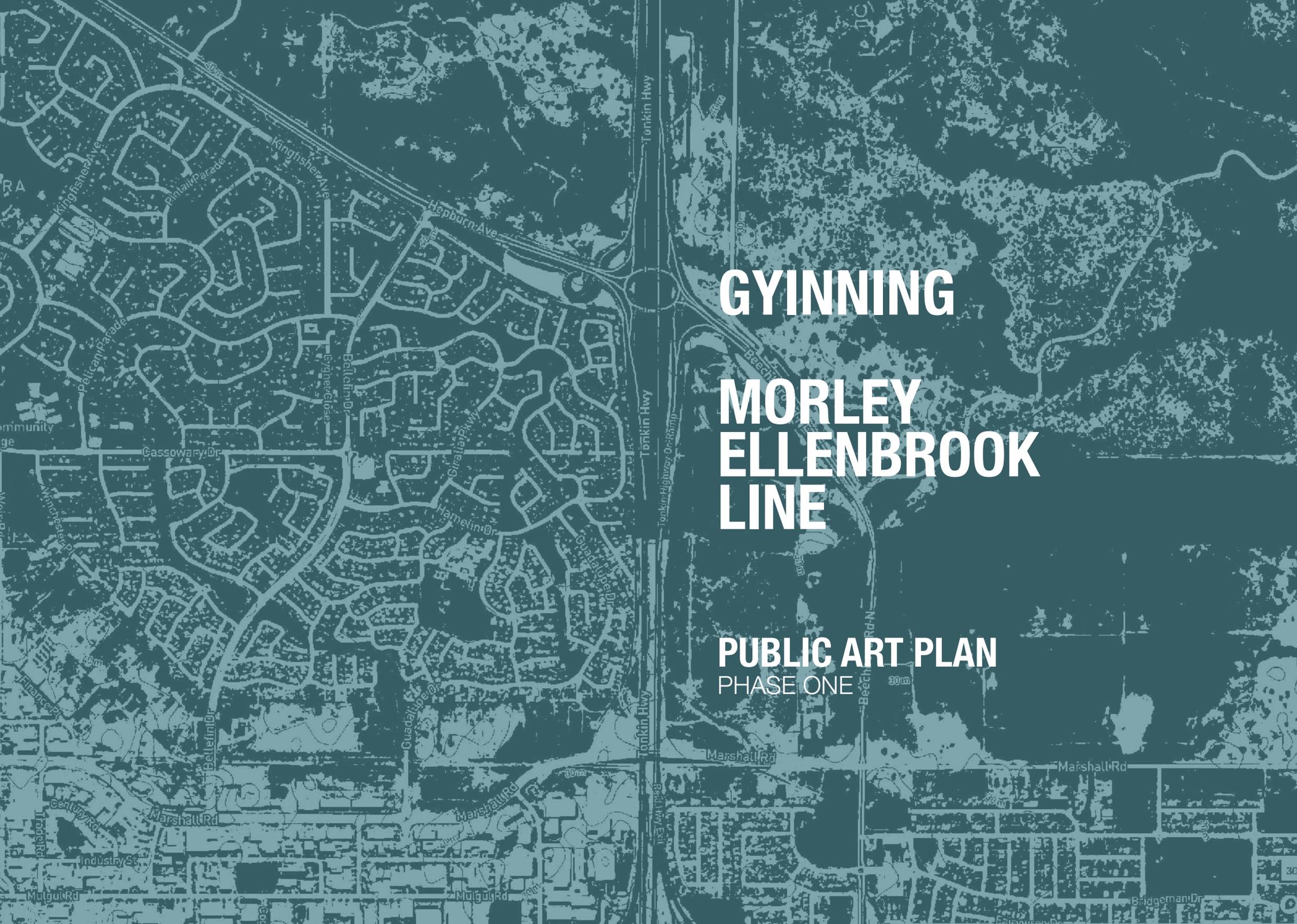
# 21. Project Actions

A list of outstanding issues and assumptions that may affect the design are outlined in the Table below.

ID	Outstanding Issues	Potential Effect	Status
1	Acoustic Consultant Report	Revised materiality and insulation requirements to station design to resolve sound reverberation and sound proofing issues	Impact to be assessed and relative design changes made in IDD
2	DA Application and Conditions	May impact architectural and landscape design	Impact to be assessed and relative design changes made in IDD
3	OGA and SDRP comments close out	May impact design	Options to respond to comments are being assessed from a cost and viability point of view
	Gnarla Biddi / Public Art	Detailed Gnarla Biddi / Public Art proposals need to be incorporated into the landscape and architecture which will impact design.	Ongoing, pending approval of Public Art Strategy and procurement of artists to develop proposals.
	Specialist Lighting	Specialist / feature lighting proposals need to be developed and coordinated	Ongoing, pending development of lighting consultant proposals based on Lighting Strategy.

		which will impact landscape and architecture design.	
	Irrigation Water Source	Continued investigations into water source, availability and pressure at connection may require adjustment to irrigation strategy and detailed design.	Ongoing, pending approval of irrigation strategy and proposed departures from SWTC. Inputs from authority stakeholders to be concluded. Scheme water pressure at connection to be confirmed.
	Ellenbrook Town Centre In-Ground Services	Future-proofing for proposed (currently unconstructed) in-ground services adjacent to Village Common may impact current Village Common design assumptions and proposals.	Ongoing, pending coordination with town centre developer.
	Confirmation of all proposed / outstanding SWTC departures or PTA Deviations	Items pending resolution may impact direction of landscape design resolution.	Ongoing, pending PTA agreement.
	Validation of all Precinct Services Design	Adjustment to current proposed services and/or future proposed services may require landscape design adjustment.	Ongoing as part of IDDR phase design refinement.
	Landscape Value Mgmt.	Continuing landscape value management processes may impact design or result in proposals to amend aspects of the brief.	Ongoing.

## Appendix I – Public Art Plan



# GYRNING MORLEY ELLENBROOK LINE

**PUBLIC ART PLAN**  
PHASE ONE



**Public Art Consultant**  
Malcolm McGregor

TITLE	AUTHOR	REVISION	DATE
PUBLIC ART PLAN	M MCGREGOR	A	1 JUN 21

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## Acknowledgement of Country

We acknowledge the People of the Noongar Nation as the Traditional Custodians of the land and waters on which the MELconnx program of projects is located.

We pay our respect to their Elders, both past and present and thank them for their continuing connection to country, culture and community.

We acknowledge that Noongar languages are oral in nature and this can result in the same word being spelt in multiple ways.



# 01

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## INTRODUCTION

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## 1.2 PURPOSE

### PUBLIC ART PLAN

The Public Art Plan (the Plan) will guide the planning and delivery of public artworks undertaken as part of the Morley-Ellenbrook Line project.

**The Public Art Plan: Phase One** addresses the three northern stations at Ellenbrook, Whiteman Park and Malaga, that are currently more advanced in their design.

**The Public Art Plan: Phase Two** will address the remaining southern stations at Noranda and Morley.

It is envisioned that the Plan will be used by artists, architects, landscape architects, project managers, contractors, LGAs and community groups, as part of the Morley-Ellenbrook Line's program of works.

The Plan will also act as a guide for organisations such as the City of Bayswater, City of Swan, Development WA and private developers involved in public art commissioning within the greater station precincts. It will:

- ▶ Outline the PTA and METRONET expectations for integration of public artworks into the planning and delivery of the Morley Ellenbrook Line.
- ▶ Provide a curatorial framework to assist in the preparation of artist briefs and to ensure consistency across the public art program.
- ▶ Develop the Sense of Place Statements, with input from the broader project team, for inclusion in the Final Place Plans.
- ▶ Identify a variety of art types for each station and common elements across stations that can be developed as a coherent suite of artworks along the line.
- ▶ Identify the forms, locations and budget allocations for public art across the project;
- ▶ Outline the artwork procurement process through to delivery, including commissioning, contractual issues, management and review.
- ▶ Identify strategies for incorporating artworks from emerging artists, or other creatives unfamiliar with public art commissioning processes; and
- ▶ Identify stakeholder engagement associated with the public art process, including, but limited to, Noongar Reference Group, METRONET Office, LGAs, community and other stakeholders.

# 1.3 BACKGROUND

## METRONET

METRONET is the State Government’s vision to integrate transport and land use planning and provide a framework to support sustainable growth in Perth over the next 50 to 100 years.

More than just a rail infrastructure program of works, METRONET planning goes beyond the station forecourts to shape and support development of communities within the surrounding walkable catchments.

Stage One of METRONET is proposed to deliver approximately 72km of new passenger rail and up to 18 new stations which represents the single largest investment in public transport in Perth’s history.

METRONET will create the opportunity to transform Perth through an expanded rail network that will see urban intensification in more than 5,000 hectares of land within walking distance of the stations, supporting delivery of the State’s metropolitan growth strategy for Perth and Peel.



## MORLEY-ELLENBROOK LINE

The Morley-Ellenbrook Line will give people living and working in Perth's north-eastern suburbs more transport choice and will be a catalyst for future urban growth.

The project will provide 21km of new track spurring from the existing Midland Line east of Bayswater Station and includes five new integrated station precincts.

The new rail line extends from the existing Bayswater Station, enters the median of Tonkin Highway where it heads north to include new stations at Morley and Noranda. The line then dives under Tonkin Highway north of Marshall Road and runs east to Malaga Station, before turning north along Drumpellier Drive to Whiteman Park Station.

The line ends at the new station within the town centre of Ellenbrook. Future-proofing also includes provision for an additional station at Bennett Springs. In addition to the station and station precincts, the project incorporates site wide civil and rail works within the rail corridor and Tonkin Highway median.

Major new structural elements include grade separated structures such as ramps, viaducts, dives, tunnels and bridges extending over and under the new rail

The MELconnx Consortium has been awarded the contract to build the Morley Ellenbrook Line. Laing O'Rourke Australia Construction is leading the consortium.



# 02

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CONTEXT

## 2.1 GUIDING DOCUMENTS

### OVERVIEW

The early planning stage has involved a number of government agencies, including DevelopmentWA, PTA, METRONET and the Department of Local Government Sports & Cultural Industries (DLGSC).

Complementary documents have been developed to guide ongoing planning and delivery of key elements of the METRONET program, including.

- ▶ METRONET Public Art Strategy;
- ▶ METRONET Gnarla Bidji Aboriginal Engagement Strategy;
- ▶ METRONET Noongar Cultural Context Document; and
- ▶ METRONET Station Precinct Design Guide.

The documents support a holistic and integrated design approach, with each discipline contributing to the overarching project vision.

### METRONET Public Art Strategy

The METRONET Public Art Strategy guides decision making and selection of public art across the METRONET program for both transport infrastructure and station precincts.

The strategy provides a thematic guide and identifies program level art opportunities that will be refined and developed for each project in the Public Art Plan. The strategy aims to:

- ▶ Delivery of a diverse program of high-quality public art;
- ▶ Support the legibility of public spaces connected to stations and other transport infrastructure;
- ▶ Animate public spaces, showcase local cultures and build place identity;
- ▶ Promote Aboriginal connection to place, culture and community;
- ▶ Encourage creativity and innovation;
- ▶ Support employment opportunities for professional and emerging artists; and
- ▶ Leave a positive and enduring legacy.

### METRONET Public Art Guide

The Public Art Guide provides details for how the METRONET Lead Agency will meet the requirements outlined in the Public Art Strategy by:

- ▶ Inspiring the project's overall design and delivery to ensure the infrastructure connects with place and community;
- ▶ Creating a Sense of Place Statement, that recognises the histories, stories, beliefs and value of Noongar and non-Noongar people;
- ▶ Identifying public art themes and approaches;
- ▶ Describing public art types and allocations;
- ▶ Providing line-wide and station priorities;
- ▶ Identifying stakeholders and engagement processes;
- ▶ Describing the expected management, procurement and review processes; and
- ▶ Completing the Public Art Plan to guide the forms, locations and budget allocation for public artworks.

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## GNARLA BIDDI Aboriginal Engagement Strategy

The METRONET Aboriginal Engagement Strategy outlines the WA State Government commitment to embed genuine engagement with the Aboriginal community across the METRONET program.

It recognises that appropriate and authentic Aboriginal engagement can contribute to the delivery of enhanced place and project delivery outcomes, whilst also achieving significant community, social and economic benefits through cultural contribution and participation.

The strategy supports outcomes that align with the METRONET vision, purpose and objectives by ensuring:

- ▶ Noongar culture is reflected in the infrastructure designed and built as part of the METRONET program;
- ▶ Education for those involved in the METRONET program on the significance of Noongar culture;
- ▶ Ongoing Noongar input into project planning and delivery processes; and
- ▶ Workforce and industry participation for Noongar and other Aboriginal people.

## METRONET Noongar Cultural Context

The Noongar Cultural Context document has been developed in close consultation with the METRONET Noongar Reference Group (MNRG).

The group provided input and comment on the document to convey a Noongar 'sense of place' for the Gyinning / Morley-Ellenbrook Line by sharing stories and cultural themes behind each place and its people.

The document summarises both publicly available content and stories for the project area and seeks to:

- ▶ Facilitate early and ongoing engagement between METRONET, the Public Transport Authority and the Noongar Reference Group;
- ▶ Describe the 'sense of place' by mapping the storylines that have created the place or other relevant cultural themes;
- ▶ Inspire project designers, architects and artists to develop themes and concepts during the design process; and
- ▶ Promote artwork opportunities for Noongar artists.

## METRONET Station Precinct Design Guide

The METRONET Station Precinct Design Guide (Station Precinct Guide) outlines key objectives and specific design advice to be considered in the design and planning of station precincts across the Perth metropolitan rail network as part of the METRONET program.

The intent is to provide guidance for decision making, planning and design of newly developing and redeveloping station precincts.

It aims to embed best practice sustainable place-making principles into the design, development and ongoing function of station precincts.

The Station Precinct Guide introduces design objectives that are fundamental to supporting the delivery of all METRONET station precinct and provides long-term expectations for station precincts based on a range of place types.

## 2.2 PUBLIC ART POLICIES

### WA STATE GOVERNMENT Percent for Art Scheme

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, police stations and hospitals.

The scheme is managed by the Department of Finance in partnership with the Department of Local Government, Sport and Cultural Industries, which is responsible for arts policy in the State.

The scheme requires up to one percent of the construction budget for new works over \$2 million, to be spent on public artwork.

It has established industry standards for public art, including procurement models and 'fit for purpose' artist contacts that have been adopted by other State Government agencies such as Main Roads WA, PTA, DevelopmentWA and LandCorp.

### CITY OF BAYSWATER Percent for Public Art (2017)

The City of Bayswater's 'Percent for Public Art' policy relates to the provision of public art for development proposals and provides guidance on how and where the City of Bayswater will apply the policy to enhance and promote the public realm and streetscape to:

- ▶ Facilitate public art that contributes towards creating a strong sense of place, which promotes the expression of local identity and responds to the culture and character of the community.
- ▶ Facilitate public art that positively contributes to its streetscape.
- ▶ Improve legibility by introducing public art which assists in making streets and buildings more identifiable.

The policy applies where a development proposal on private land has a construction cost of \$1 million or greater and is a commercial, non-residential or mixed use development.

The cost of any public art provided under this policy is to be no less than 1% of the construction value of the eligible development proposal.

### CITY OF SWAN Public Art Policies

The City of Swan's policy supports public art by:

- ▶ Developing and locating public artworks in areas of significance and meaning to the community;
- ▶ Ensuring public artworks are sensitive to their local environment and communities of interest;
- ▶ Installing public artworks on sites selected specifically for their suitability with regard to the conception, development and installation of a work of art;
- ▶ Where possible, supporting and promoting high calibre local artists;
- ▶ Building strong partnerships with the Federal Government, State Government, other Local Governments, and the City's Art sector to ensure that the opportunities for quality public art are maximised;
- ▶ Funding public artwork through the City's capital works program and operational budget processes; and
- ▶ Utilising developer cash-in-lieu contributions as per policy POL-LP-1.10 Provision of Public Art.

# 03

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APPROACH

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## 3.1 GUIDING PRINCIPLES

### CONNECTIONS AND PATHWAYS

Transport infrastructure projects can be complex, with delivery occurring over an extended timeframe. The five station and associated civil infrastructure provide numerous public art opportunities.

The success of these projects will be largely dependent on an art procurement models that is equitable and responsive to evolving project needs. Along with other objectives, the public art program aims to:

- ▶ Deliver a diverse program of high-quality public art;
- ▶ Encourage creativity and innovation;
- ▶ Support opportunities for professional and emerging artists;
- ▶ Promote Noongar cultural input into place making; and
- ▶ Ensure commissioning, mentoring and training opportunities for Noongar and Aboriginal artists.

Meeting these goals requires an art procurement approach that is equally creative, flexible and innovative. It enlists a number of strategies to enable the participation of a wide range of artist and creatives over the duration of the project.

### OPEN AND EQUITABLE

The Expression of Interest will be widely promoted to Western Australian artists and creatives. The aim is to establish a creative pool that can be drawn upon as art projects are developed.

The pool will include highly experienced and emerging artists, as well as other creatives that may contribute to the art program.

### PARTNERSHIPS

The art program will foster connections between artist, creatives design professionals, suppliers and fabricators. One of the biggest challenges for emerging artists is access to the skills, specialist expertise and resources needed to undertake a public art project.

The procurement process will explore ways of up skilling artists through strategic partnerships. The Alliance team can assist by providing information on designers, materials, suppliers, fabricators and installers.

### MENTORING

The art program will include mentorship opportunities designed to provide career pathways that build new skills and employment opportunities for Aboriginal artists.

The mentorship program will allow Aboriginal visual artists to develop their skills through a structured and supported process. More detail is provided in the following sections.

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## OPEN COMPETITION

Open competition is fair and equitable in that it allows all artists and creatives to be considered for station projects. The Expression of Interest can be widely promoted to Western Australian artists and creatives, with submission requirements tailored to achieve the best outcome for the project.

The open completion process can establish a creative pool of suitably qualified artists and creatives that can be drawn upon as art projects are developed.

The pool will include highly experienced and emerging artists, as well as other creative that may contribute to the program. Artists can submit Expressions of Interest as individuals or as part of a creative team that includes the requisite skills and capabilities.

## NOONGAR PROJECTS

The procurement model seeks to minimise potential barriers to participation by new and emerging Noongar artists, in line with other State Government initiatives.

The public art program will explore multiple pathways for Noongar artists to contribute to the project. This may include open competition, limited invitation, direct engagement or a structured workshop process.

The Expression of Interest for Noongar artists will allow for a targeted response to project requirements and support a collaborative approach to Noongar place making. Selected artists may participate through the following pathways:

- ▶ Shortlisted artists invited to prepare a Concept Design, or
- ▶ Selected artists invited to participate in design workshops for 'design only' elements, or
- ▶ Selected artists invited to participate in mentoring program.

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## ABORIGINAL ENGAGEMENT FRAMEWORK

The METRONET Aboriginal Engagement Framework sets targets for engagement with Noongar and other Aboriginal stakeholders during planning and delivery. The Plan establishes actions to address the relevant engagement streams.

### STREAM ONE

Noongar Cultural Recognition

- ▶ Ensure 'Welcome to Country' occurs at all appropriate art events in accordance with advice provided by the Noongar Reference Group;
- ▶ Include Acknowledgement of Country in the design of built form and/or landscape for all five stations

### STREAM TWO

Noongar Cultural Input into Place Making

- ▶ Initiate a collaborative design process that enables Noongar artists to contribute to the architectural and landscape design of stations;
- ▶ Embed themes and stories contained within the Noongar Cultural Context Document within the architectural and landscape design,
- ▶ Liaise with the METRONET Noongar Reference Group, though the development of designs and approval.

### STREAM THREE

Aboriginal Procurement

- ▶ Encourage Noongar artists and creatives to register as Aboriginal Businesses with the Aboriginal Business Directory WA (ABDWA) and Supply Nation;
- ▶ Explore opportunities for Noongar suppliers and fabricators in delivering the public art program;

### STREAM FOUR

Aboriginal Employment

- ▶ Facilitate career development opportunities for Noongar artists and creatives;
- ▶ Engage Noongar cultural advisors to contribute to the interdisciplinary design approach
- ▶ Enable skills development and capacity building opportunities for Noongar artists through a structured mentoring program

## PUBLIC ART PRINCIPLES

The METRONET Public Art Strategy identifies six public art principles that will guide decision making through the planning and delivery of the Public Art Program.



### Place Making

Public art contributes to place making and interpretation of place. It can aid the understanding of the area's history or cultural heritage, assist how people currently understand or use a space, or provide new interpretations and meanings.



### Site Specific

Artworks are to be designed specifically for the site and are to be responsive to the site context - its surrounds, its use and users, and reflecting the relevant precinct art themes.



### Scale and Fit

The scale of artwork needs to be consistent with the artwork brief and intent. Artwork scale also needs to be responsive to the site context - such as the surrounding landscape and buildings and pedestrian circulation.



### Well Considered & 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.



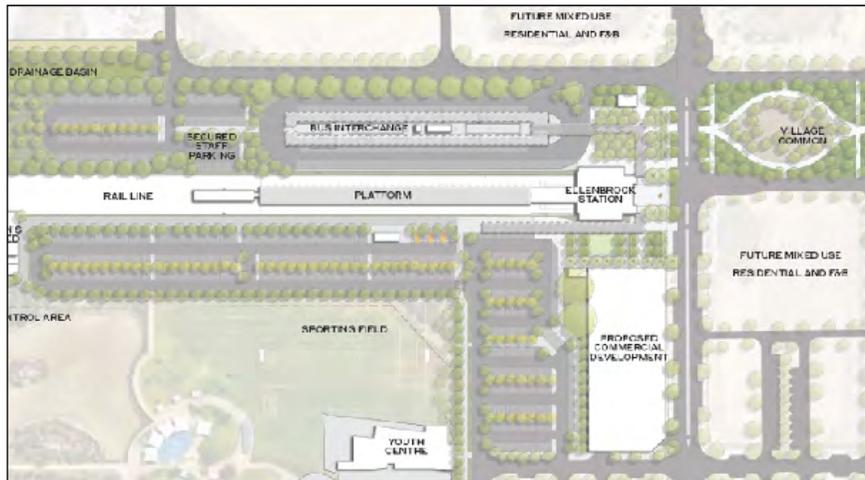
### Attractor

Public art can be used as an attractor for visitors and tourists – particularly places with landmark artworks or seasonal art programs.



### Sustainable

Public art is designed to consider key environmental, social and economic opportunities for both procurement/delivery and ongoing function and use.



## TRANSPORT INFRASTRUCTURE

The METRONET Public Art Strategy provides a thematic guide and program level art opportunities for transport infrastructure and station precinct public art.

Transport infrastructure includes the construction of stations, bus ports, forecourts, carparks and road networks within the station boundary. It also includes civil infrastructure, such as ramps, viaducts, dives, tunnels and bridges located within the new rail corridor.

The Plan's primary focus will be art opportunities within the transport infrastructure that can be delivered within the scope and duration of the MELconnx contract.



## STATION PRECINCTS

The broader definition of station precincts extends beyond the immediate station area to include public spaces, principal shared pathways (PSP) and pedestrian connections to the stations that are not an immediate part of the Morley-Ellenbrook Line project.

Responsibility for some areas rests with State Government agencies, the City of Bayswater, City of Swan and private developers. Station precincts will continue to develop over different timeframes as a result of future changes around new stations.

Most agencies involved in the ongoing development of station precincts already have public art policies and guidelines in place. The Plan will provide an additional resource to assist public art delivered within the broader station precincts over time. It may also facilitate thematically linked stories and approaches across the rail network.

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## 3.2 CURATORIAL FRAMEWORK

The curatorial framework identifies themes and narratives to encourage a cohesive approach to public art across the five stations.

The framework responds to planning, place-making and station precinct design principles established across the Morley-Ellenbrook Line. It acknowledges METRONET's attitudes towards site context, urban character, landscape values and the station's architectural typology.

The curatorial framework acknowledges the values and future aspirations of all stakeholders, local community members and transport users. It includes a vision for public art, describing what it aspires to achieve within the project.

### CURATORIAL VISION

The curatorial vision is a resource for artists in developing site-specific responses to culture, landscape and place. It provides contextual inspiration and a starting point for artistic exploration.

Every station precinct has unique physical and functional characteristics that will affect its potential to develop as a liveable, vibrant urban centre. Public art will build on broader initiatives within the project to:

- ▶ Embody notions of identity and place, benefit local communities and leave a positive legacy for future generations;
- ▶ Foster connections between people and places, revealing embedding stories, ideas and authentic experiences within the stations and surrounding public space;
- ▶ Celebrate the cultural diversity of communities and people;
- ▶ Draw on community values to provide active public spaces that can be enjoyed day and night;
- ▶ Contribute to the activation of new town centres, neighbourhood centres and transit node precincts;
- ▶ Create new gateway and arrival experiences for public transport users and the broader community; and
- ▶ Enrich daily life and support community gathering in a vibrant and safe environment.

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## 3.3 CURATORIAL THEMES

The Curatorial Themes provide a high-level thematic guides which encapsulate various qualities of the diverse topographies, station types and communities along the Morley-Ellenbrook Line.

Evoking elements of the local history, landscape and people, they can act as an initial source of inspiration for artists, ensuring that artworks forge meaningful connections to the locality and community.

Public art can make a significant contribution to developing a sense of place around the new station precincts, where people feel a sense of longing of belonging.

Creating a place of belonging and an ambience where people can feel comfortable and safe can have positive consequences, encouraging people to visit or return frequently.

The three themes of Gather, Dwell and Stream encompass both universal experiences and evoke stories and narratives specific to people and places along the new rail line.

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## GATHER

### Social Encounters

Station precincts are places of arrival and departure. They are meeting and gathering points that are an expression of local identity and the communities that they service.

Local life can be described by the social encounters in a vibrant town centre. Whether spontaneous or planned, social experiences add to the richness of daily life. Within the station they can us make us feel comfortable and safe.

Before their was a city, Noongar people gathered on the Swan Coastal Plain to hunt, fish and celebrate culture. New stations, town centres and public spaces will become the places where people meet, rest and play.

## DWELL

### Being of a Place

The landscapes and places along the line have changed significantly over time. From the wetlands and banksia woodland that was once there, the land has been shaped and altered.

The new line will accelerate that rate of change, creating new places and making the familiar less so. Though much of the original vegetation is gone, the line continues to reveal its topography and offer spectacular vistas to places beyond.

The pattern of land subdivisions, laid across the landscape largely remain today. Their boundaries shape the networks of roads that connect the suburbs and people.

Communities continue to evolve as farmlands give way to suburbs and commercial areas. As the city moves outward, people seek new ways of connecting to places and making it their home.

## STREAM

### Passing Through

The streams and wetlands are ancient. They have sustained life in the area for millennia. From deep beneath the surface, the water rises and flows towards the river.

The stream exists within the landscape and as a metaphor for the confluence of pathways, routes and cultures. It is a place where people camped, gathered food. It sustains farmlands and is an attractor for recreation .

The stream can be the experience of travel and transition across the landscape. It embodies the experience of movement and change that defines the rail journey. It is the life force that connects places.

Beneath the station the stream is still there, hidden.

## 3.4 ARTWORK TYPES

Public artworks provide markers and episodes along a journey. They can be categorised by their scale, form and contribution to place-making principles.

### LANDMARKS

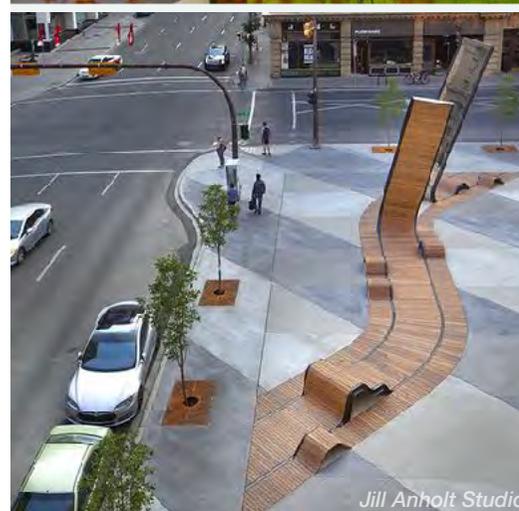
Landmark artworks can emphasise arrival or gateways points where their scale and visibility make them identifiable and memorable. Sited at locations with high pedestrian or vehicular visibility within station precincts they can be major place-making moments. Whether stand-alone or integrated into the built form, they can become destinations, acting as wayfinding markers and recognisable meeting points.

### PRECINCT MARKERS

Located at a nodal, decision and rest points within the station precinct, they can assist with intuitive wayfinding through placement and form. They may consist of a single focal element or multiple elements extending along pathways or routes.

### FINE GRAINED

Typically small-to-medium scale, fine grained artworks may be integrated or stand-alone. Sited in locations with high pedestrian activity, such as meeting points or waiting areas, they introduce moments of surprise, pause and intrigue. Collectively, they can build complex narratives about place within the station precincts and may be integrated into functional elements such as walls, screens, seating and paving.



# STAND ALONE

The METRONET Public Art Strategy uses the DLGSC Public Art Commissioning Guidelines to define main categories of public art, recognising that boundaries between art types overlap.

Stand-alone artworks are arguably, the best known and recognised form of public art. They include sculptural works at a variety of scales, from landmark artworks that are major attractors and destinations through to small-scale elements interwoven within the landscape design.

They can be singular works sited at locations with high visual impact or be a series of small scale elements disbursed throughout a public space.

Stand-alone artworks are usually acquired through a standard artist commissioning process, with the artist responsible for design, fabrication and installation.

On more complex construction projects, artworks are sometimes delivered to site, with installation by the construction contractor or their subcontractors.



Stuart Green



Rod Garrett



Kylie Graham



Phil Gamblen

# INTEGRATED

Integrated artworks is a broad category that includes art concepts and design elements integrated into the fabric of built form and urban environments. Often developed through a collaborative design process, the artist is best engaged during the early design stage.

Art concepts can be incorporated into the overall design as 'value added' elements, allowing artist to respond to the scale of the buildings and landscaped environments. This could include treatments to walls, ceilings, glazing, screens and floors, landscape elements and paving.

Integrated artworks can be developed as 'design only' or through a standard commissioning process. There can be a combination of approaches with the artists sometimes responsible for documenting, fabricating and installing the artwork elements.



# APPLIED

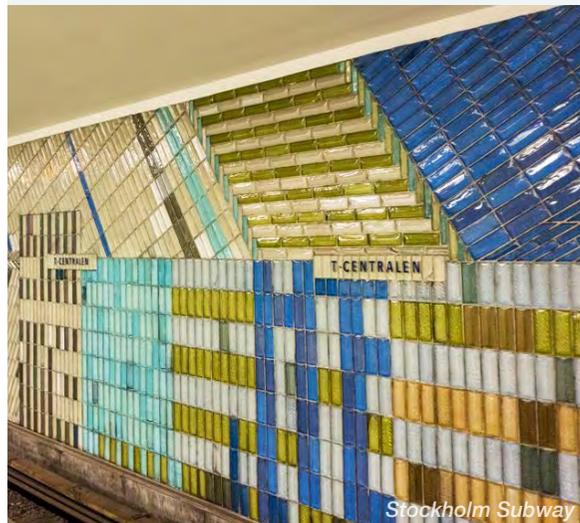
Applied public art is defined as elements applied to existing surfaces and structures. It may include, but not limited to, painted finishes, tiling, metal or other elements fixed to existing walls, floors or ceilings. They can be permanent or semi-permanent in nature.

Applied artworks are often designed and fabricated by the artist with installation towards the end of construction or after project completion.

To some extent, the artist is able to develop and fabricate artworks independently of the built form, meaning that they can be introduced later in the design process.

Applied artworks are usually acquired through a standard artist commissioning process, with the artist responsible for design, fabrication and installation.

On more complex construction projects, artworks are sometimes delivered to site, with installation by the construction contractor or their subcontractors.



# TEMPORARY

Temporary or programmed artworks include non-permanent artworks or events which activate a specified space or location for a pre-determined amount of time.

Temporary artworks add a vital layer of life and energy to public spaces, providing new experiences that build a sense of place over time, engage the community and encourage repeat visitation.

Temporary or programmed works can be curated as part of festivals or events and include a wide variety of art forms including hoardings, art installations, light festivals, musical and theatrical performances.

Art events can play a crucial role in place activation over time. During the station construction phase they can be a vehicle for positive community engagement. Post construction, they can be instrumental in the activation of new spaces and building a sense of community ownership.



# LIGHT

Light can be a crucial component of any artwork types. At its most simple level, it may involve the illumination of artworks to enhance their night-time presence. At its best, it becomes an integral component of the artwork concept.

Light may be integrated into the fabric of the built form and urban environments as art concepts. They can become part of the overall design, allowing artist to respond to the scale of the buildings and landscaped environments.

Sculptural works may incorporate light at a variety of scales, from landmark artworks that are major attractors and destinations through to small-scale elements interwoven within the landscape design.

Light can be an integral component of temporary or programmed works, curated as part of festivals or events. it can play a crucial role in place activation and safety.



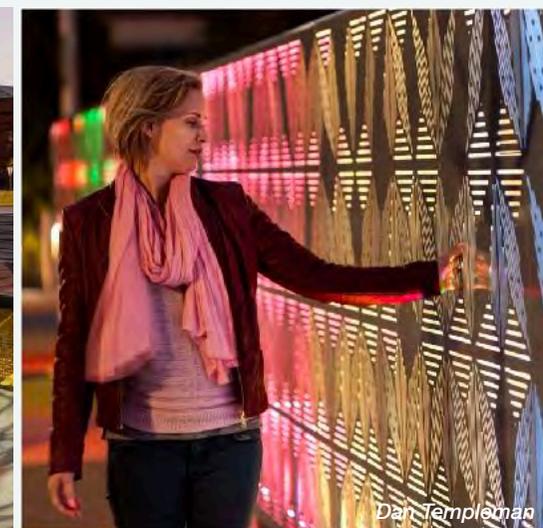
Jim Sanborn



Chris Nixon and Tom Lucey



Midland Railway Square



Dan Templeman

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## 3.5 PROCUREMENT MODELS

### ART COMMISSIONS

The majority of public artworks are procured through a standard commission process. The artist is usually responsible for the full scope of work, including design, documentation, fabrication and installation of the artwork.

The method is most relevant for stand-alone and applied artworks, which constitute the majority of public art projects.

The art commission model can also be appropriate for some integrated artworks, depending on the nature of the integration. The standard two stage process for artist selection involves:

- ▶ Shortlisted artists from the Expression of Interest are invited to prepare a Design Concept;
- ▶ Shortlisted artists present their Design Concepts to the selection panel who select one artist or artist team;
- ▶ Alternatively, the selection panel may interview shortlisted artists and invite one artist to prepare design options before completing the Design Concept.

### DESIGN COLLABORATIONS

Sometimes referred to as 'Design Only' artworks are developed through a collaborative design process, with artists ideally engaged in the early design stages.

Design elements are incorporated into the overall design as 'value added' elements, allowing artist to respond to the scale of the buildings and landscaped environments.

The artist is responsible for the Design Concept and Design Development only. The documentation, fabrication and installation is delivered as part of the larger project. Artist selection involves the following:

- ▶ Shortlisted artists from the Expression of Interest are interviewed by the selection panel. Alternately, artists may be shortlisted from a limited invitation.
- ▶ One artist or artist team is selected and engaged to prepare design options through a collaborative design process.
- ▶ The preferred options are developed into the Design Concept for approval before proceeding to Design Development.

A variation of this model can be applied to artworks developed through design workshops and mentoring programs.

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## MENTORSHIPS

Noongar artist mentorships can provide career pathways that build new skills and employment opportunities. The approach responds to the Gnarla Biddi Engagement Streams by:

- ▶ Ensuring Noongar stories and culture is represented in the infrastructure that is designed and built as part of the METRONET program; and
- ▶ Providing direct employment and career development opportunities for Noongar and other Aboriginal people.

The mentorship program can build on other government and private sector initiatives that encourage capacity building for Aboriginal artists.

It will allow Noongar visual artists to develop their skills through a structured and supported process, with artists paid to participate in skills development workshops.

The project will engage Noongar artists, who will be mentored throughout the design process by cultural advisors, materials specialists, fabricators and the Alliance design team.

The METRONET Noongar Reference Group will also play an important role in story telling and the use of the cultural material. The mentorship will be implemented in two phases:

### Phase 1

Noongar artists will be invited to submit an Expression of Interest. From the submissions, a number of artists will be selected to participate in design workshops.

The workshops will assist the artists in concept development. Cultural advisors will discuss ideas and stories from a Noongar perspective and talk to artists about what is culturally appropriate to depict on-site.

In Phase 1, the artists will learn:

- ▶ How to engage with clients, design professional and stakeholders;
- ▶ Designing for 2D and/or 3D built form;
- ▶ Translating artworks using various materials and fabrication processes; and
- ▶ Preparing a Design Concept.

### Phase 2

Approved concepts will be selected to continue to Design Development. The selected artists will continue with the project, providing further input and learning about the translation of their designs into built form.

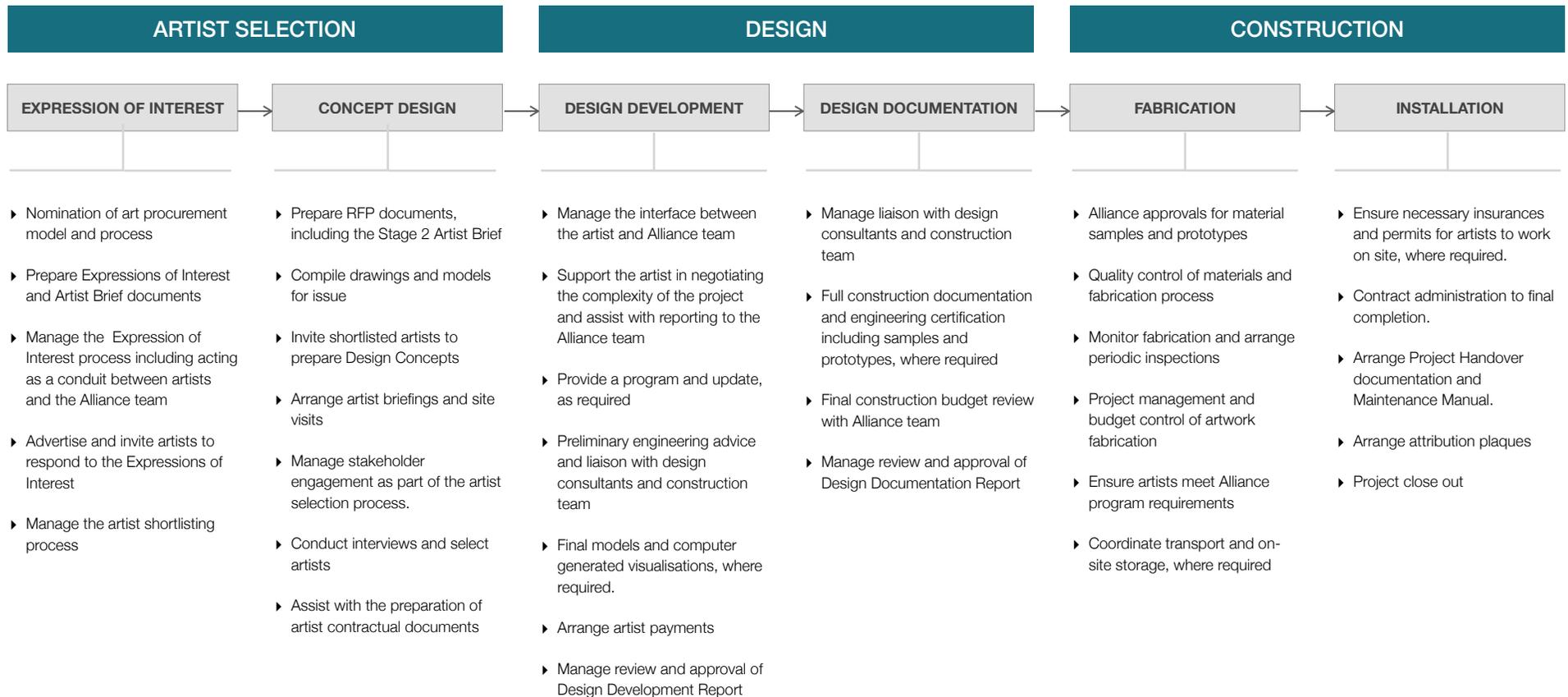
Throughout the program, artists will learn the process for the integration of public artwork from commencement to completion.

This may include visit to factories and studios where the artwork is being fabricated, as well as site visits and learning about construction site safety.

In Phase 2, the artists will learn:

- ▶ What is involved in Design Development;
- ▶ Understanding construction drawings;
- ▶ Fabrication and installation processes; and
- ▶ Safe conduct and on-site compliance.

## 3.6 PROCUREMENT PHASES



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## 3.7 CONTRACTS

Artist agreements will set out the obligations and conditions of all parties involved in the public art program.

MELconnx has been nominated as the commissioning body for public artworks delivered through the art program. 'Fit for purpose' contracts will need to be developed that address the various ways that artists may be engaged.

The DLGSC Commissioning Guidelines (2019) provides a best practice model for engagement of artists. The BMW Artwork Commission Agreement is used for artist commissioned through the State Government Percent for Art Scheme and is based on the Arts Law standard agreement.

Other State Government departments and agencies such as PTA, LandCorp, DevelopmentWA and Main Roads WA have also adopted the agreement.

The State Solicitors are currently reviewing PTA's artist commission agreement as a potential model for artists engagement. Artist may be engaged under three broad categories:

### Design Concepts

Shortlisted artists are invited to prepare a Design Concept in response to a Stage 2 Artwork Brief, which sets out the conditions and submission requirements. Artists are paid a small fee which is based on the value of the commission and the complexity of submission requirements. Conditions can be usually be addressed through a Letter of Agreement and reference to the Stage 2 Artwork Brief.

### Design Agreement

A design agreement can be used when the artist is engaged for the Design Concept and Design Development stage only. In some instances, the agreement may also specify limited involvement in the implementation phases. Documentation, fabrication and installation is delivered as part of the larger project and is not the artists' responsibility.

### Commission Agreement

The majority of public artworks are procured through a standard artist commission agreement. This form of contract is appropriate when the artist is responsible for the full scope of work, including design, documentation, fabrication and installation of the artwork.

## 3.8 PRELIMINARY BUDGET

The preliminary budgets provides high level allocations for public artworks. Percentages have been assigned to zones within the station precincts rather than to individual art projects. Budgets for individual project will be determined as the opportunities become more defined. The amounts are currently inclusive of:

- ▶ Design Concept fees
- ▶ Commission budgets
- ▶ Design Workshop fees
- ▶ Noongar Mentoring
- ▶ ‘Value added’ costs for integrated artworks
- ▶ Contingencies and disbursements
- ▶ Contractors’ margin

The allocations are based on the ability to maximise the visual impact of public art by ‘value adding’ to existing architectural and landscape elements, where appropriate.

This will be particularly crucial when considering potential input into urban design solutions for civil infrastructure that are currently not included in the scope of works.

An updated schedule for all five stations will be included in the Phase 2 Plan.



### STATIONS

<b>Ellenbrook</b>	Welcome Place	25%
	Gateway	25%
	Station Building	20%
	Bus Interchange	20%
	Place Activation	10%
<b>Whiteman Park</b>	Welcome Place	25%
	Pedestrian Underpass	25%
	Gateway	20%
	Station Building	20%
	Place Activation	10%
<b>Malaga</b>	Welcome Place	50%
	Station Building	45%
	Place Activation	5%

# 04

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LINE WIDE

## 4.1 CONTEXT

The Morley-Ellenbrook Line is a connector for the central and northern suburbs of Perth. It creates an expanded web of connected places in distinctive landscapes and settings on the Swan Coastal Plain.

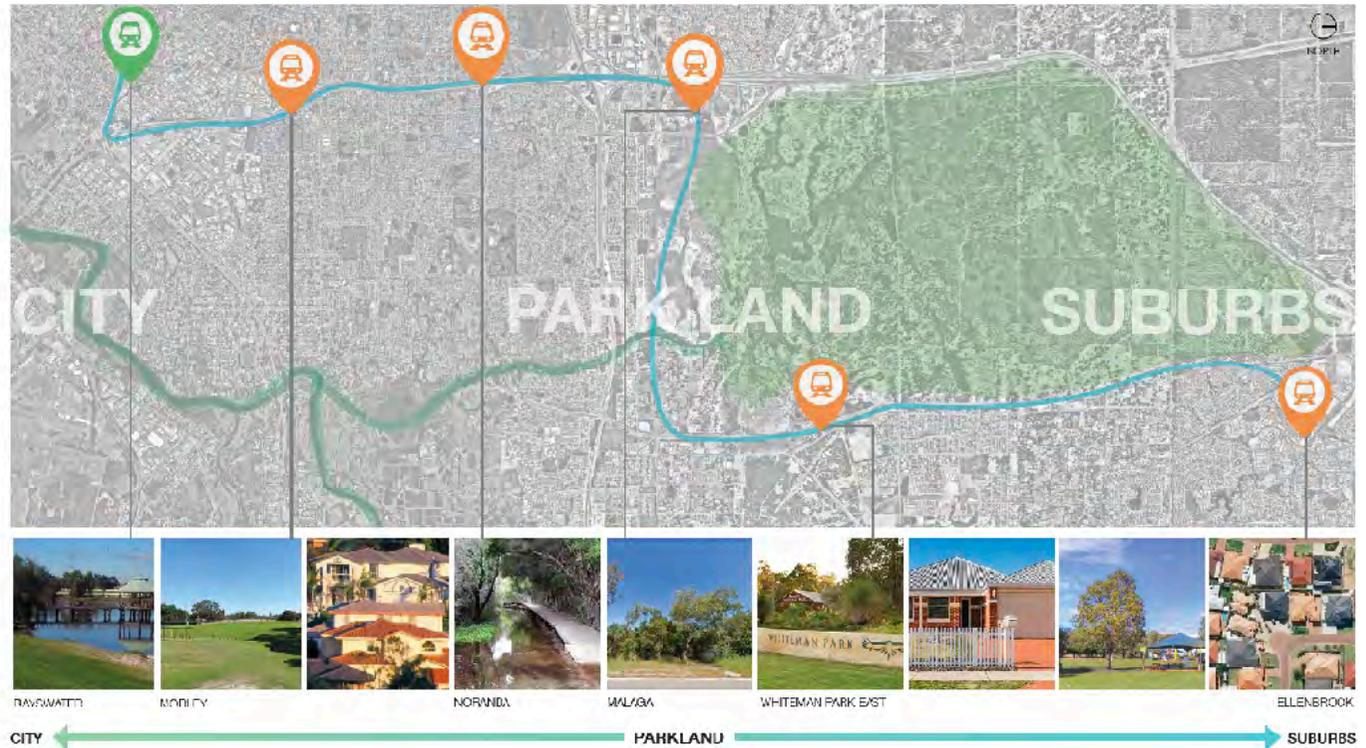
The new rail line echoes the path of the Swan River, which provides landscape markers as it meanders northwards into the Avon Valley. The line will become an equally distinctive marker and corridor in the urban landscape.

The rail line, like the river, links various points along the way. The idea of connection along the trail translates into a more integrated family of station buildings and precincts: a line and an extension to the greater transport network.

Initially tracking north through established suburbs and road infrastructure, it cuts east below Whiteman Park and across Bennett Creek.

As it swings north towards Ellenbrook, and up the eastern flank of Whiteman Park, it shadows the upper reaches of the Swan River to the east, forming a man-made reflector of light along the length of the line.

Each station is conceived as an important civic place – distinctive, contextually appropriate and a safe and inviting setting for the gathering and movement of people on and off the train line.



# STATION PRECINCTS

Stations precincts are convergence points and places of transition between transport modes and the surrounding environment. Public art can contribute to the legibility of these functional spaces by responding to the way people use them.

## WELCOME PLACE

The Welcoming Place is the heart of the station precinct. It is the place where people arrive in the town or suburb and can be an expression of the community's identity and sense of place.

The Welcome Place is a meeting place where people congregate or wait before proceeding on their journeys. It is also the place where people need to make decisions when making transfers. It is also a primary focus for public artworks, including:

- ▶ Large-scale destination artworks intended to be an iconic attractor that is easily identifiable and highly memorable;
- ▶ Medium-scale precinct markers that define nodes, focal points and decision points;
- ▶ Small-to-medium scale artworks and integrated elements that introduce elements of surprise, pause and intrigue.



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## KISS AND RIDE

The Kiss and Ride is a focal point within the car park. It is a transitional zone where the user's priority is accessing vehicles, drop-offs and passenger pick-up.

Public artworks may assist with guiding people towards the station building. They may take the form of elements integrated into canopies, arbours or pavement treatments.

## BUS INTERCHANGE

Located at bus stands, along pathways and routes, artworks can be a variety of forms, primarily integrated into the fabric of transport infrastructure.

They can tell stories, explore themes or assist in orientation while guiding users towards the station building.

## ENTRIES

Precinct entries need to provide clear connections and pathways to the Welcome Place, Station and Bus Interchange. Public art in these locations needs to be appreciated at a vehicular, cyclist and pedestrian scale and may:

- ▶ Reinforce major gateways or arrival points; and
- ▶ Strengthening wayfinding along key pedestrian corridors.

## CIVIL INFRASTRUCTURE

Civil infrastructure along the 21km route includes roads, tunnels, underpasses, viaducts, retaining walls and noise walls. Most of this infrastructure is currently not included in the scope of the public art program, which focuses on station buildings and precincts.

In some instances, the impact of civil infrastructure can be significant. Public art can respond to the scale of the infrastructure by contributing to urban design solutions that provide gateway experiences or mitigate visual impact.



## STATION BUILDINGS

As people arrive at the train station the experience must be quick and easy. The space needs to be organised around smooth flows and intuitive wayfinding, that provides all the clues before relying on signage.

Artworks may be experienced progressively as station users move along pathways and through zones. They may frame and direct attention towards spaces beyond.

Artworks may be incorporated into the fabric of the building to provide a more diffused or immersive experience. They can be integrated into surface treatments, such as walls, metal screens, soffit treatments or glazing.

## 4.2 SENSE OF PLACE

The Sense of Place Statements are intended to ensure that design decisions for station buildings, precinct elements and public artworks align with community values and expectations.

The Public Art Plan includes Sense of Place Statements for each station precinct on the Gyning/Morley-Ellenbrook Line. They draw sources, including on the METRONET Noongar Cultural Context Document, Preliminary Place Plans and relevant Local Area Plans.

The Sense of Place Statements have also benefited from the input of community reference groups established for each project areas along the line, with the City of Bayswater and City of Swan playing key roles in representing community interests.

The statements establish common themes, narratives and stories for the whole line, as well as distinct local stories specific to certain localities.

They are not intended to be an extensive history for each station area. However, they will be available as a resource when developing the curatorial framework and themes included in artwork briefs.



# THEMES AND STORIES



## Sense of Place

The Morley-Ellenbrook Line encapsulates a variety urban and natural experiences as it travels through diverse landscapes along its 21km journey.

The rail line, like the Swan River, links various points along the way. The idea of connecting stories and themes along the line translates into a more integrated family of station buildings and precincts: a line and an extension to the greater transport network.

Line wide and location-specific stories and themes are addressed in detail under the relevant station heading.



## Gnarla Biddi

“ Since the Koondarm our ancestral pathways have guided us through Noongar Boodjar from significant place to significant place from one water body to another.

Now we work together to strengthen Gnarla Biddi, the way that people travel and connect to places, still linked to our shared history and culture.”

The Gnarla Biddi statement provides a unifying and all encompassing theme that is relevant to all artists, whether Noongar or non-Noongar.

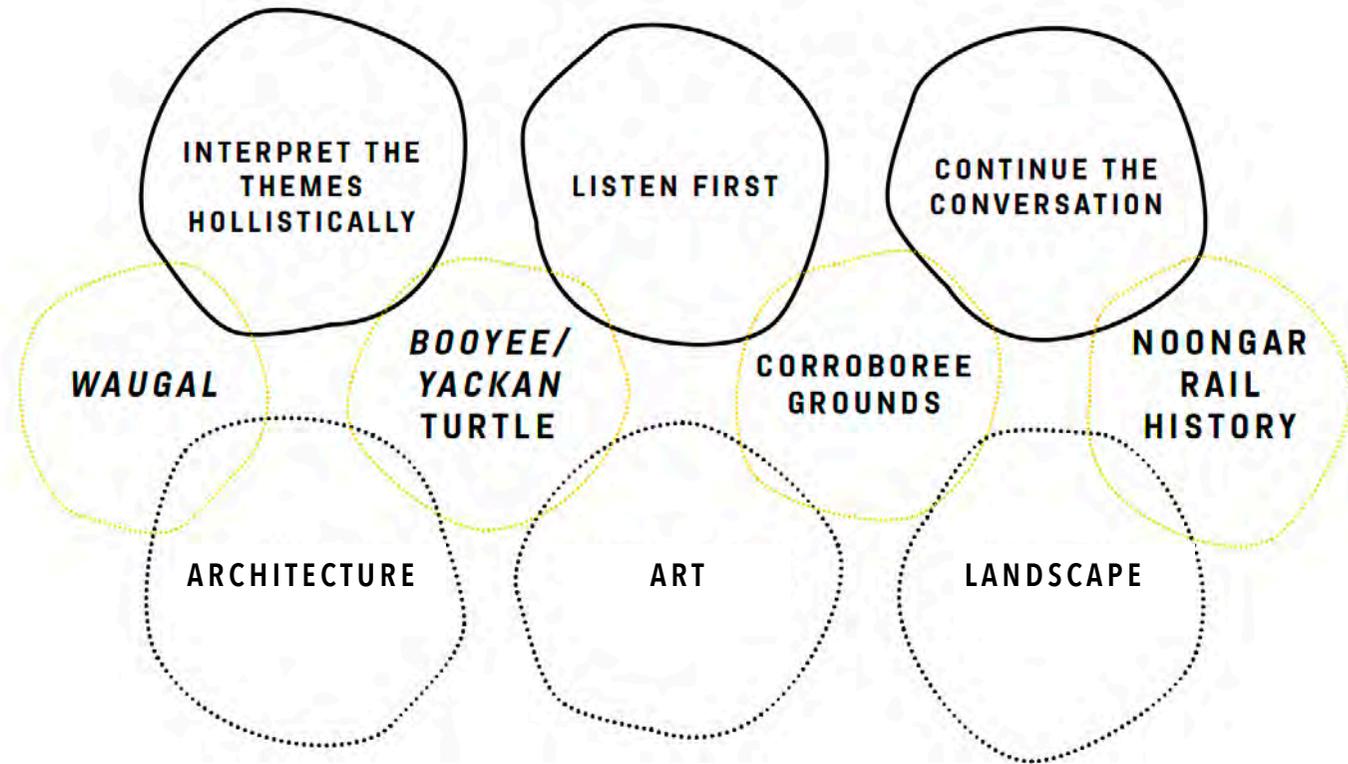


## Noongar Cultural Context

Significant local themes include, but are not limited to:

- ▶ Waugul - the creation story of the spirit/rainbow serpent; a place of water with many wetland and river features;
- ▶ Turtle (Boyee or Yackan) - Illustrating belief in the shared spiritual essence of all living things
- ▶ Corroboree Grounds - Important meeting and ceremony places within the biddi network;
- ▶ Noongar Rail History - Language maintenance, cultural renewal and resistance, travelling, residence and return to country through the railways.

# THEMES AND STORIES



The Noongar Cultural Context Document identifies line-wide themes that will be developed through a collaborative design approach that embeds Noongar culture into the design of station precincts and buildings.

Public art will draw on the stories and knowledge provided by the METRONET Noongar Reference Group. Artwork concepts will initially be developed to reinforce and complement elements of the landscape design, including planting, furniture, paving and signage.

Artwork concepts and design elements may also be incorporated as 'Design Only' elements in station buildings.

Design workshops will include both experienced Noongar artists and emerging Noongar artists engaged through the Mentorship initiative.

# THEMES AND STORIES

The Noongar Design Workshops will play an important role in Noongar story telling and interpretation of cultural material.

## DESIGN WORKSHOPS

The workshop process will allow sufficient time for artists to have meaningful engagement with the Noongar Reference Group, cultural advisors and the Alliance team.

It will also allow time for artists to become familiar with the complexities of the rail project and to develop concepts through a structured and supported process.

The thematic approach will be informed by the overarching Gnarla Biddi theme of ‘Our Pathways’ while also addressing the following sub-themes:

- ▶ Acknowledgement of Country
- ▶ Shared Stories and Knowledge
- ▶ Cultural Mapping
- ▶ Noongar Language
- ▶ Dual Naming
- ▶ Meeting Place
- ▶ Culturally Significant Plants
- ▶ Bush Foods & Medicine
- ▶ Seasonal Flowers & Fruits
- ▶ Totemic Species



The initial focus will be on concepts that can be incorporated into landscape elements in station precinct at Ellenbrook, Whiteman Park and Malaga. Potential design elements may include:

- ▶ Garden beds
- ▶ Furniture and paving
- ▶ Wayfinding signage
- ▶ Interpretation

Architectural elements may include, but is not limited to:

- ▶ Facade treatments
- ▶ Metal screens
- ▶ Glass balustrades

# 05

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STATIONS

# 5.1 ELLENBROOK STATION



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## URBAN CONTEXT

Ellenbrook Station is at the end of the bush rail experience. The station precinct is located on Parkway, which is a high quality streetscape with paving, street trees and seating. The Plane Trees along the street create a leafy green feel and provide sanctuary in the summer months.

Pine trees are significant markers in the landscape, both within the station precinct and in the distance. As remnants of the pine plantations, they create a feeling that this place has a previous heritage and sense of establishment.

The station precinct is dotted with small and larger places for human interaction, from a bench under a tree to a market plaza. It is inviting, village-like in scale and stimulates friendliness in a contemporary architectural setting.

The vision for Ellenbrook was for a range of 'villages', set in the semi-rural landscape of the Swan Valley and clustered around a town centre. Development commenced in 1992 and much of the vision has now been realised.

When completed, the town centre will include shopping, office space, entertainment and community services to a regional catchment of approximately 70,000 people. It will provide business and employment opportunities to the local population and include a mixture of dwelling typologies for residents.

Ellenbrook Centre is designed as an 'open air' town centre, in contrast with enclosed shopping centres, allowing users choice in how they access the centre at various times. The street network, diversity of public spaces and large iconic gestures strategically placed throughout the town provide a rich and interesting journey of discovery and a backdrop to daily life.

The station project will reinforce Parkway role as the second main street in the town centre. The station's forecourt, framed by buildings, will become a major destination, complementing the town square and main street. Together these streets and public spaces will create a primary loop at the heart of the pedestrian network.

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## HISTORY

Ellenbrook was named after Ellen Brook, the nearby tributary of the Swan River, which was itself named for Ellen Stirling, the wife of Captain James Stirling, Western Australia's first Governor.

Ellen Brook, is known by the Aboriginal place name of "Gyinning", a significant site as it is also an Noongar camping grounds.

The abundance of water in the area would have meant that before European colonisation, the precinct was an important location for food resources and it was noted that the river bank was evidentially a digging ground for yams.

European settlement of the area dates from the 1830s when the first land grant was made. Growth was slow, with land used mainly for farming. Significant development did not occur until the 1990s.

Rapid growth took place from the early 1990s, particularly with development of The Vines and the several villages being developed around the town centre at Ellenbrook.

Growth continued between 2001 and 2006, with the population nearly doubling, a result of a significant number of new dwellings being added to the area.

## ENVIRONMENT

The Ellenbrook area contains a mix of remnant native vegetation types and one of the most floristically rich areas of native vegetation on the Swan Coastal Plain.

The mix of vegetation types provides considerable diversity with at least twenty five vegetation types having been identified in the area. The area has been identified as a national treasure with Zamia palms and Xanthorrhoea standing for several hundred years.

With more than 400 plant species, the area contained the most diverse plant species in the metropolitan area; twice that found in Kings Park or Whiteman Park. A rich array of native fauna is also present due to the mixing of Coastal Plain and Darling Scarp species.

The area is included in the habitat of the critically endangered Western Swamp Tortoises, which were thought to be extinct before their rediscovery in 1953. They are currently being bred at the Perth Zoo and being released in several sites including the Ellen Brook Nature Reserve and Twin Swamps Nature Reserve.

The Ellenbrook local area contains many Bush Forever sites within and around its boundary, including the Egerton Spring Mound.

## SENSE OF PLACE

The Preliminary Place Plan provides a vision for the station precinct with an authentic character that reflects its context and local community's aspirations, making the place cared for, safer and activated.

It seeks to provide a distinct experience that is different from other places. This gives people from elsewhere a reason to visit and frequent this place. To achieve this and elicit a sense of belonging in the community, the Ellenbrook Station Precinct should have the following qualities:

### **Village Buzz**

The precinct radiates as the centre of a village atmosphere. It feels relaxed, informal and tranquil, with many restful break-outs and pathways to wander.

### **Warm and Friendly**

The precinct feels friendly and inviting. It is a place that is human centric and embracing, full of social spaces that nurture all members of the community.

### **Landscape in Mind**

A village surrounded by a significant landscape of the Swan Valley and pine plantations. The village is part of the landscape it is set in. The natural topography filters through and greenery is dominant as it governs the views.

# STATION PRECINCT



Ellenbrook Station is the line's most urban and integrated precinct. It is located in the growing town centre, south of The Parkway and west of Civic Terrace.

The station is at the end of the bush rail experience. Coming out of the old pine plantations, the train arrives in the centre encapsulating the essence of the Ellenbrook villages. The station and its precinct will be an anchor point in the town centre, a meeting place bustling with activity.

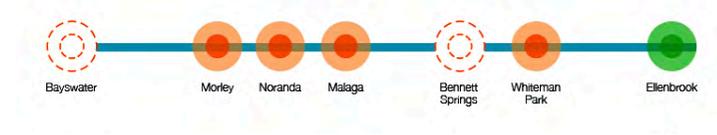
The station features a 150-metre-long island platform, half of which will be sheltered. There will be two car parks either side of the station, with a total of five hundred car bays.

A dedicated bus interchange with twelve bus stands will be constructed as well, providing feeder bus services to nearby suburbs.

The station is slightly outside the railway alignment so that a new station can be constructed whilst the old one is still in use, when the rail line needs to be extended.



# 1 Welcome Place



## Curatorial Vision

The Welcome Place will be the heart of the station precinct and the new Ellenbrook town centre. It is a meeting place where people congregate or dwell before proceeding on their journeys. The artworks will celebrate Ellenbrook's cultural diversity, revealing embedding stories and ideas and authentic experiences.

Artworks will be small to medium scale elements that will contribute to the waiting experience. Integrated into the landscape design, they will express line wide and location specific themes developed through a collaborative design process.



## Artwork Intention

Integrated landscape elements are part of the line-wide approach that identifies common themes and narratives shared across stations.

The artworks are fine grained expressions of connection and place that build a community identity. They can:

- ▶ Celebrate local culture, history and stories.
- ▶ Encourage exploration and discovery;
- ▶ Provide day and night time activation;
- ▶ Enrich the user experience by providing fine-grain elements that assists with wayfinding.

## Scale

- ▶ Medium-scale precinct markers that define nodes, focal points and decision points;
- ▶ Small-to-medium scale artworks and integrated design elements that contribute to the waiting experience.

## Artwork Types

- ▶ Coloured, sandblasted or inlaid concrete paving
- ▶ Informal sculptural seating
- ▶ Interpretive signage and text elements.

## Budget

25% of overall station art budget

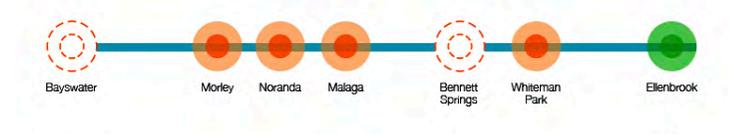
## Procurement Method

The development of line wide integrated landscape elements may be achieved by:

- ▶ 'Design only' elements developed as line wide themes through Noongar Design Workshops
- ▶ Open Competition

Art Zone

## 2 Gateway



### Curatorial Vision

The Landmark Artwork will emphasise the civic nature of the central location as the primary gateway and arrival point. Its scale and visibility will make it identifiable and memorable to station users and others visitors to the town centre.

Sited on the central axis of the station and visible along the Parkway, it can be a major place-making moments. It will become a destination, a wayfinding marker and a recognisable meeting point.

The artwork may be a singular large scale sculpture that acts as a beacon at night or multiple elements located within the central paving or garden bed.



### Artwork Intention

- ▶ Create a gateway and arrival experiences for public transport users and the broader community;
- ▶ Contribute to civic expression and activation of the town centre;
- ▶ Celebrate the cultural diversity of Ellenbrook communities and people;
- ▶ Enrich daily life and support community gathering in a vibrant and safe environment;
- ▶ Celebrate local culture, history and stories;
- ▶ Provide day and night time activation.

### Scale

- ▶ Large scale precinct markers that defines the primary convergence point; or
- ▶ Medium scale sculptural elements that collectively achieve high visual impact.

### Artwork Types

- ▶ Freestanding sculpture
- ▶ Large scale sculptural form that may also act as Informal seating
- ▶ Sculptural installation consisting of multiple elements

### Budget

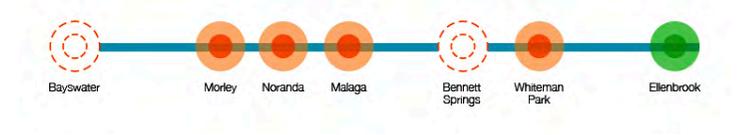
25% of overall station art budget

### Procurement Method

- ▶ Open Competition

Art Zone 

## 3 Station Building



### Curatorial Vision

Integrated into the fabric of the station building or perimeter fencing, the artworks will be 'value added' elements appreciated from internal areas or external treatments viewed from multiple locations, including car parks, bus interchange, pathways, platforms and landscaped spaces.

The artwork may be part of the line-wide approach, emphasising the connections between stations or a more localised response to Ellenbrook Station. Within the internal waiting area they may be detailed elements integrated into the glazed screens. Externally, artwork elements may replace standard perimeter fencing in nominated areas.



### Artwork Intention

Integrated architectural elements are part of the line-wide approach that identifies shared themes and narratives across stations.

Artwork are fine grained expressions of place and connection that build a community identity and leave a positive legacy for future generations.

They can:

- ▶ Provide common elements and thematic connections between stations;
- ▶ Celebrate local culture, history and stories;
- ▶ Encourage exploration and discovery;
- ▶ Enrich the user experience by providing fine-grain elements that improve the waiting experience and assist with wayfinding.

### Scale

- ▶ Small-to-medium scale integrated elements that may extend over large distances, subject to costing.

### Artwork Types

- ▶ Perforated metal screens
- ▶ Fritted glass
- ▶ Interpretive signage and text elements

### Budget

20% of overall station art budget

### Procurement Method

The development of line wide integrated architectural elements may be achieved by:

- ▶ 'Design only' elements developed as line wide themes through Noongar Design Workshops
- ▶ 'Design only' elements developed through Open Competition

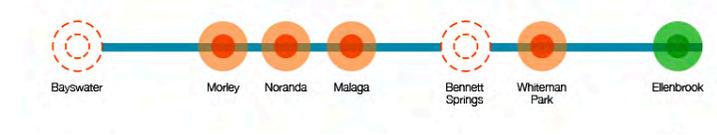
Art Zone 

## Bus Interchange

### Curatorial Vision

The landscape spaces and pathways provide connections between the bus interchange and station building. They are high pedestrian traffic areas experienced on a frequent and daily basis. They are also meeting places where people congregate or dwell before proceeding on their journeys.

The canopy directs bus users from the interchange to the station, reinforcing the central east/west spine and pedestrian route. The artwork may be integrated or applied soffit elements that frame the landscape space. Lighting may be a key component to provide a night-time presence.



### Artwork Intention

- ▶ Celebrate local culture, history and stories;
- ▶ Contribute to community identity and sense of place;
- ▶ Celebrate the cultural diversity of Ellenbrook communities and people;
- ▶ Enrich daily life and support community gathering in a vibrant and safe environment;
- ▶ Encourage exploration and discovery;
- ▶ Enrich the user experience by activating landscape places;
- ▶ Improve the waiting experience and assist with wayfinding.

### Scale

- ▶ Large scale 2D or low relief artwork that may extend the entire length of the wall.

### Artwork Types

2D integrated or low relief applied artwork, that may be comprised of:

- ▶ Laser cut or perforated metal
- ▶ Applied metal or composite elements
- ▶ Printed, etched or sandblasted onto cement fibre or composite substrate.

### Budget

20% of overall station art budget

### Procurement Method

- ▶ Open Competition

Art Zone 

# 5.2 WHITEMAN PARK STATION



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# URBAN CONTEXT

## WHITEMAN PARK

Whiteman Park Station is located at the edge of Whiteman Park and across from the suburb of Brabham. The station precinct is located in area that is an important buffer between the Park's core and suburban developments to the east.

Whiteman Park is a unique conservation and recreation reserve, covering 4,000 hectares of natural bushland and leisure facilities. The Park is a centre for environmental heritage and conservation of endangered fauna. Preservation and promotion of Noongar culture and connection to Country is core to the Park's strategic planning.

Whiteman Park is located on the doorstep of the Swan Valley, one of Western Australia's most visited attractions with more than one million visitors each year. The Park includes a range of attractions and facilities, including the Whiteman Village, Motor and Tractor Museums, Caversham Wildlife Park, the heritage tram line and an array of recreational facilities.

Playgrounds and picnic areas are located throughout the Park, connected by walking tracks and an extensive cycle network.

## URBAN GROWTH CORRIDOR

The Urban Growth Corridor stretches approximately eight kilometres from Ellenbrook to Caversham in the south. It is bounded by Whiteman Park to the west and the Swan Valley to the east.

The suburban development of Brabham is adjacent to the station and includes homes, schools, shops and recreational areas. The future shopping centre will be within walking and cycling distance of the station. From the train station east, an activity focused main street with increased residential density is proposed, connecting the shopping centre and future high school.

The 'Old Caversham Airfield' is located to the east of the station precinct and Drumpellier Drive. The site includes a Bush Forever area that connects Whiteman Park with the Swan Valley. The remains of the Australian Grand Prix circuit, used in 1957 and 1961, are located in the area.

Prior to urban development beginning in the corridor, the land consisted of small lot farming and lifestyle blocks. Other uses in the area included grazing, poultry farms, a mushroom farm and viticulture activities.

The majority of these land uses have now ceased and development has commenced across pockets of the Urban Growth Corridor.

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## CULTURAL SIGNIFICANCE

The land that makes up Whiteman Park has high cultural significance for Noongar people, with strong mythological and historical connections.

Aboriginal groups would travel along the reaches of Bennett Brook, hunting and gathering food while moving from camps in the Guildford area to Lake Gngangara, then beyond to the freshwater chain of wetlands that extend from Lake Goollelal to Yanchep.

The Park has extensive wetland systems associated with Bennett Brook and its tributaries, with most of the registered Aboriginal Heritage sites within the Park connected with the Brook.

There are five registered sites of significance to Aboriginal people within the current boundaries of Whiteman Park. They include artefact scatters and sites of cultural significance.

## ENVIRONMENT

Whiteman Park is a unique conservation and recreation reserve that covers nearly 4,000 hectares of natural bushland and leisure facilities. It offers a range of natural environments as well as more formal recreation areas and historically themed facilities.

The conservation area encompasses a range of diverse habitats, with the sands of the Swan Coastal Plain supporting woodlands of marri, jarrah and banksia; extensive heathland; melaleuca wetlands and unique ephemeral damp lands.

Nearly half of Whiteman Park's land is retained for the conservation of wildlife - essentially as a means to provide protected habitat for a wealth of plant and animal species native to the area.

Over the past thirty years considerable environmental research has been undertaken into the wildlife and ecology of the Park and this assists its future management.

The Park is located over the Gngangara Water Mound and thus its existence protects one of Perth's major sources of drinking water.

## HISTORY

Whiteman Park takes its name from Mr Lew Whiteman who purchased land in the area in 1939 for the purpose of grazing cattle, before developing the popular picnic spot of Mussel Pool in the 1960s.

From 1977 to 1990, landholdings were purchased by the State Government from numerous owners, including Mr Whiteman. The creation of the parkland also served to protect the Gngangara Water Mound, a vital source of drinking water for the Perth metropolitan area, and create a haven for local flora and fauna.

In 1986, Whiteman Park was officially opened and named in recognition of Mr Whiteman's pioneering development of the public open space.

Areas west of Beechboro Road and along the Bennett Brook south to the Swan River came under Whiteman Park management in 1999 and 2001.

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## SENSE OF PLACE

Whiteman Park is in the heart of the bushland experience of the Morley-Ellenbrook Line. Arriving at Whiteman Park station is arriving in Whiteman Park itself.

The station precinct is the Park's forecourt, a meeting ground at the gathering of pathways, old and new, relaxed and dynamic, natural and human, in a natural bushland setting.

The place is infused by the Noongar understanding of 'biddi'. The water ways, bushland, native plants and wildlife of the Bennett Brook system and Whiteman Park are all around.

They are supplemented by reminders of newer history - the heritage tram, air strip and grand prix circuit. All are combined with beautiful walks trails and cycle routes, adventurous play and relaxed picnic areas.

People are living around the corner, with a gateway-class underpass to future shops, schools and urban activity in Brabham, while the elevated rail frames views from Drumpellier Drive to the Whiteman Park bush and entrance.

The Whiteman Park station precinct is more than a transportation hub. It should be a place that feels occupied and 'owned' by the community it services.

The Sense of Place is built on an authentic character that reflects its context and the local community's aspirations, making the place cared for, safer and activated.

The Preliminary Place Plan provides a vision for the station precinct that reflects its context and community aspirations. The Whiteman Park Station Precinct should have the following qualities:

### **Awe of Nature**

Arriving at the station precinct evokes a sense of awe. It is omnipresent, in the buildings and public realm alike and being treated with dignity. The place is a respite from the urban bustle, and beautiful with a sense of roughness much like the bush.

### **Intertwined**

The station precinct is an emerging experience where everything feels connected not just physically but also in mind and in time. Paths, streams, cultures, stories and people meander through creating nodes for deeper engagement and understanding.

### **In Motion**

The precinct feels mature yet forward-looking. It is layered, where the new is gracious and respectful to the old, remembering the old ways. A place that is flowing; fast and slow, permanent and ephemeral.

# STATION PRECINCT



The station precinct will be located near the intersection of Drumpellier Drive and Youle-Dean Road, near the main entrance to Whiteman Park, which is a nature reserve and recreational tourist attraction.

Situated on the edge of Whiteman Park, the station precinct will have a relaxed bush feel. It will include a bus interchange and car parking, providing efficient transport links to nearby Bennett Springs, Dayton, Brabham, and Henley Brook.

The station precinct is the Park's forecourt, a meeting ground at the gathering of pathways, all located in a natural bushland setting.

A gateway-class underpass will connect transport users to future shops, schools and urban activity in Brabham, while the elevated rail line frames views from Drumpellier Drive to the Whiteman Park bush and entrance.

A pedestrian underpass under Drumpellier Drive connects the station to the rapidly growing suburb of Brabham.



# 1 Welcome Place

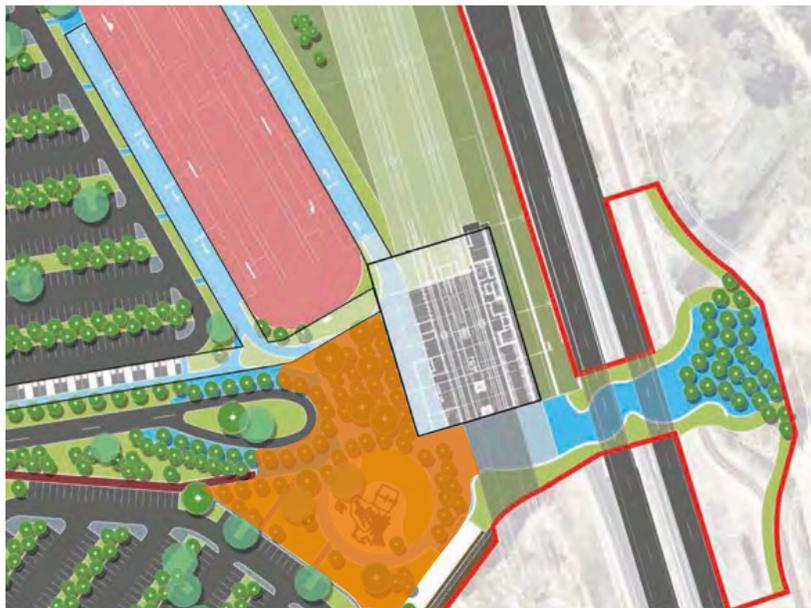


## Curatorial Vision

The Welcome Place will be the heart of the station precinct and a gateway experience for visitors to Whiteman Park.

The artworks will be inspired by the richness of the natural parkland setting and its significance as a biodiversity hotspot. They will celebrate Noongar connection to place through the expression of cultural stories and themes.

Artworks will be small to medium scale elements, integrated into landscape and playscape designs. They may express line-wide and location specific themes developed through a collaborative design process.



## Artwork Intention

Integrated landscape elements are part of the line-wide approach that explores shared themes and narratives across stations.

Artworks are fine grained expressions of place that build a community identity. They can:

- ▶ Celebrate local culture, history and stories;
- ▶ Encourage exploration and discovery;
- ▶ Encourage interactive play;
- ▶ Enrich the user experience by providing fine-grain elements that assists with wayfinding.

## Scale

- ▶ Medium-scale precinct markers that define nodes, focal points and decision points;
- ▶ Small-to-medium scale artworks and integrated elements that contribute to the waiting experience.

## Artwork Types

- ▶ Coloured, sandblasted or inlaid concrete paving;
- ▶ Informal sculptural seating;
- ▶ Interpretive signage and text elements;
- ▶ Interactive play elements

## Budget

25% of overall station art budget

## Procurement Method

The development of line wide integrated landscape elements may be achieved by:

- ▶ 'Design only' elements developed as line wide themes through Noongar Design Workshops
- ▶ Open Competition

Art Zone 

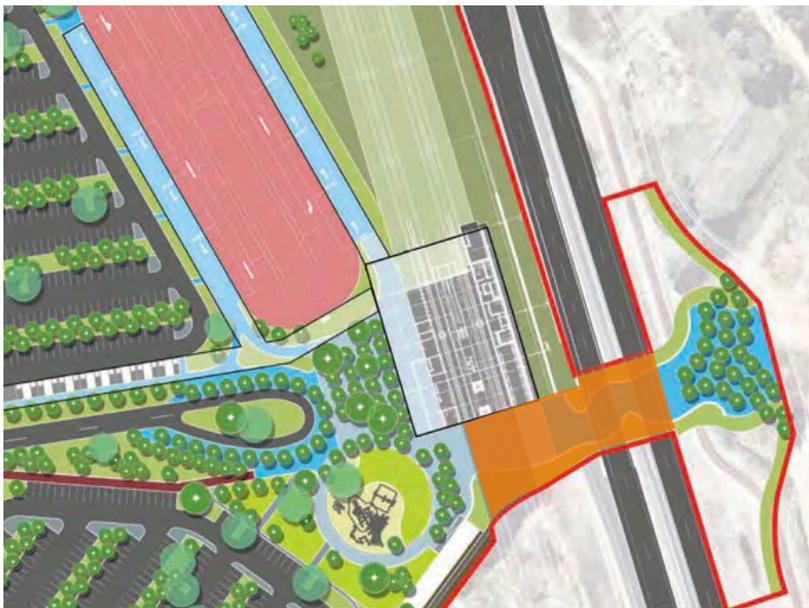
## Pedestrian Underpass



### Curatorial Vision

The Pedestrian Underpass connects the neighbouring community of Brabham to the station precinct and Whiteman Park. As the area develops, its significance as a pedestrian connection and gateway will increase.

The artwork will draw inspiration from biodiversity and landscape values of the park. It may draw on the richness of local stories and the significance of the area to Noongar people. It may be integrated into walls, soffit and paving treatments and include a lighting component to increase the night time presence and improve pedestrian safety.



### Artwork Intention

The artwork is potentially an immersive experience that gives poetic expression to the physical connections between the surrounding community and the natural environment. It can:

- ▶ Celebrate local culture, history and stories;
- ▶ Share cultural knowledge and storytelling
- ▶ Encourage exploration and discovery;
- ▶ Enrich the pedestrian experience by providing fine grained detail, colour and textural elements;
- ▶ Activate the space at night and improve pedestrian safety;

### Artwork Types

- ▶ Painted or applied elements to soffit and wall treatments
- ▶ Suspended elements
- ▶ Ground plane treatments, including coloured, sandblasted or inlaid concrete paving
- ▶ Programmable lighting
- ▶ Interpretive signage and text elements.

### Budget

25% of overall station art budget

### Procurement Method

The development of line wide integrated architectural elements may be achieved by:

- ▶ 'Design only' elements developed as line wide themes through Noongar Design Workshops
- ▶ 'Design only' elements developed through Open Competition
- ▶ Applied or stand-alone artworks through Open Competition

## 2 Station Building



### Curatorial Vision

Integrated into the fabric of the station building, the artworks will be 'value added' elements that can be appreciated from multiple external vantage points, including the car parks, bus interchanges pathways and landscaped spaces. Internally, they may be experienced within the entry building, concourse and platforms.

The approach may be line-wide, emphasising the connections between stations or a more localised response to Whiteman Park and the surrounding environment. Within the building, they may be detailed elements integrated into perforated metal or glazed screens, introducing layers of narrative, pattern and texture.



### Artwork Intention

Integrated landscape elements are part of the line-wide approach that identifies common themes and narratives shared across stations.

Artwork are fine grained expressions of place and connection that build a community identity and leave a positive legacy for future generations.

They can:

- ▶ Provide common elements and thematic connections between stations;
- ▶ Celebrate local culture, history and stories;
- ▶ Encourage exploration and discovery;
- ▶ Enrich the user experience by providing fine-grain elements that improve the waiting experience and assist with wayfinding.

### Scale

- ▶ Large to medium scale integrated elements that may extend over large areas.

### Artwork Types

- ▶ Fritted glass
- ▶ Perforated metal screens
- ▶ Interpretive signage and text elements.

### Budget

20% of overall station art budget

### Procurement Method

The development of line wide integrated architectural elements may be achieved by:

- ▶ 'Design only' elements developed as line-wide themes through Noongar Design Workshops
- ▶ 'Design only' elements developed through Open Competition

Art Zone ■

## 4 Gateway



### Curatorial Vision

The station precinct and Whiteman Park are accessed under the rail viaduct which connect them to the Drumpellier Drive and Yule-Dean Road intersection. The viaduct is the main vehicular connection to the station precinct and the park's main entrance.

The Landmark Artwork will emphasise the location as the primary gateway and arrival experience, which will become less visible beyond the civil works. It will celebrate arrival at the Park and act as an entry threshold that frames the views beyond .

It is imagined as an immersive experience, integrated into elements of the civil infrastructure, with lighting an essential component to improve night time presence.



### Artwork Intention

The artwork gives poetic expression to physical connections between communities and the natural environment. It can:

- ▶ Celebrate arrival at Whiteman Park and the bushland/parkland setting;
- ▶ Express local culture, history and stories;
- ▶ Enrich the vehicular experience by providing colour, pattern and textural elements;
- ▶ Activate the space at night and improve pedestrian safety;

### Artwork Types

- ▶ Integrated civil and urban design elements;
- ▶ Painted or applied elements to wall, soffit and column treatments
- ▶ Programmable lighting

### Budget

20% of overall station art budget

### Procurement Method

- ▶ Open Competition

Art Zone 

# 5.3 MALAGA STATION



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# URBAN CONTEXT

## OVERVIEW

Malaga is the City of Swan's major industrial precinct and its largest employment centre. Malaga has evolved into a precinct that is home to over 3,000 businesses employing approximately 15,500 workers.

The Malaga Station Precinct is located in close proximity to the surrounding suburbs of Ballajura and Bennett Springs, with Beechboro and Malaga also nearby.

Situated on the edge of an important remnant banksia woodland, the station precinct will be the heart of a large residential and mixed-use development planned for the area.

Malaga Station is where the train experience changes from the freeway rail to the bushland rail. Rising out of the tunnel from under Tonkin Highway, the train arrives at Malaga Station before traveling through the Whiteman Park landscape.

The rail corridor passes near low banksia bushland hills that forms a crescent around land feeding water into the Bennett Brook. The site provides sweeping views over the Whiteman Park plains to the Darling Scarp beyond.

Although the station will deliver connectivity to the adjoining residential communities and the Malaga industrial precinct, these areas lie behind the hills and out of view.

Future development of the Town Centre will bring radical change to area, though the landscape setting and connections to Whiteman Park, Bennett Brook Catchment, Swan River and the Darling Scarp are retained.

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## HISTORY

Malaga formed as an industrial centre, focussed around the Manx Brickworks and a sand quarry. In 1963 the area was reserved as an industrial area and in 1969 the name 'Malaga' was registered as a suburb.

It's not clear whether the name Malaga was adopted from the Spanish city of the same name or the Aboriginal word "malaga" meaning "ironstone".

Over the past 30 years, the industrial area has grown rapidly and now has more than 3,000 businesses with a workforce of almost 16,000 people.

Malaga is surrounded by residential suburbs. The largest is Ballajura which has a range of community facilities such as an aquatic centre, library, community centre, parks and public open spaces.

The Ballajura area, particularly Emu Swamp and the surrounding wetlands, has cultural significance for Aboriginal people as a source of fresh water and a hunting ground.

The Ballajura area was first settled in 1905, when Ernest Maltby Kerruish, an immigrant from the Isle of Man, purchased land for a farm at the present site, which at the time was located in Caversham. He named it Ballajora, after a farm at Maughold on the Isle of Man.

Bennett Brook ran through the Ballajora Farm. It was named after Matilda Bennett, also an Isle of Man descent who was the wife of John Septimus Roe, the first surveyor general of Western Australia under the first governor of the state, Sir James Stirling.

John Creer and Arthur Eaton, who also emigrated with Kerruish from the Isle of Man, joined him in clearing the land to build a house and begin farming the land. After a few years, Kerruish decided the soil was not fertile enough and moved his operations to an established vineyard in the present-day Caversham area, a few kilometres southeast.

By 1970, the Ballajura area was part of a larger pastoral holding and remained leased as a cattle farm until 1977.

Ballajura was developed as a residential suburb from 1978 and by 1981. The suburb was further developed in the 1980s with the establishment two sub-divisions at Lakeshore and the Lakes Estate. The population increased rapidly during the early 1990s and then slowed in the early 2000s.

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## ENVIRONMENT

The station precinct is located on the south west boundary of Whiteman Park and within the Bennett Brook Catchment. The majority of the catchment is covered by the Gnangara Pine Plantation and Whiteman Park.

Bennett Brook was once a natural creek system; however its tributaries to the west have been modified over time. The Brook is fed primarily by groundwater seepage from the Gnangara Mound and stormwater from the surrounding industrial, residential and rural areas.

The water system flows south-east before entering the Swan River, upstream of Success Hill in Bassendean.

Increased groundwater pumping in the northern part of the catchment has lowered groundwater levels, consequently reducing flow into the brook.

Conversely, the southern part of the catchment has elevated flow due to the construction of drainage networks and increased runoff from hard surfaces.

## SENSE OF PLACE

Currently the station precinct is located on semi-rural land and has no urban setting. With the future development of a town centre, the Sense of Place will change radically.

The Malaga station precinct will become the heart of the new Town Centre and should be a place that feels occupied and owned by the community it services.

In order to achieve a distinct urban experience and eliciting a sense of belonging in the community, the Malaga station precinct should have the following qualities:

### Spring

The station precinct feels like a bubbling spring reviving liveliness. People, nature and water are flowing through the spaces, aerating and animating the precinct. It is the source that is connected to the Bennett Brook system as well as the metropolitan area.

### Young

The new Town Centre is an opportunity for a new start, with fresh concepts to reconcile with the original values of the site. An uplifting precinct that raises above business-as-usual, with surprising experiences and sparkling of enthusiasm.

### Outwards

The precinct feels open and outward looking, both physically and mentally. It maximising the topographic qualities, with views to the surrounding landscape and connections outwards. It is future-orientated and looking for new horizons.

# STATION PRECINCT



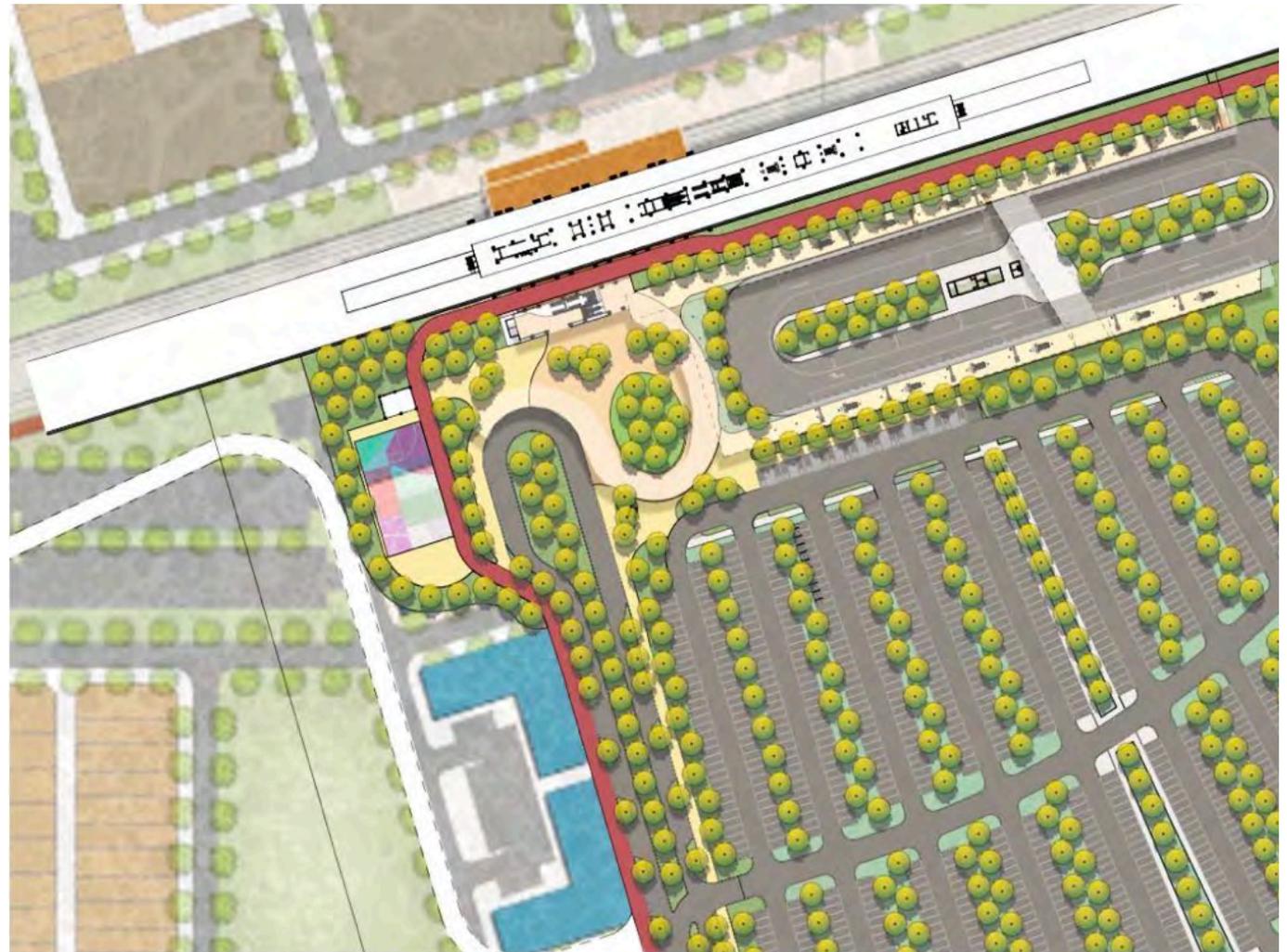
The Malaga Station Precinct is located between the suburbs of Ballajura and Bennett Springs, with Beechboro and Malaga in close proximity.

The station will be constructed on a greenfield site between Beechboro Road North, Marshall Road and Tonkin Highway in the suburb of Whiteman, allowing for future development around the station.

A large car park, located south-east of the station, will provide eleven hundred car bays and a drop off area.

A dedicated bus interchange with twelve bus stands will be constructed as well, providing feeder bus services to nearby suburbs.

Future development of a Town Centre will bring radical changes to the station's urban context. The station precinct is likely to become the town's civic heart, delivering connectivity to the adjoining residential communities and the Malaga industrial precinct.



# 1 Welcome Place



## Curatorial Vision

The Welcome Place will be the heart of both the station precinct and the new Malaga Town Centre. It is a meeting place where people congregate or dwell before proceeding on their journeys.

The artworks will celebrate emergence of the town centre and be inspired by the Bennett Brook Catchment and natural bushland setting that lies beyond. They will celebrate Noongar connection to place through the expression of cultural stories and themes.

Artworks may express line wide and location specific themes developed through a collaborative design process.



## Artwork Intention

Integrated landscape elements are part of the line-wide approach that explores shared themes and narratives across stations.

Artworks may be large-scale or fine-grained expressions of place that build a community identity. They can:

- ▶ Celebrate local culture, history and stories.
- ▶ Encourage exploration and discovery
- ▶ Enrich the user experience by providing arrival experiences and assisting with wayfinding.

## Scale

- ▶ Medium scale precinct markers that define destinations, meeting points and decision points;
- ▶ Small-to-medium scale artworks and integrated elements that contribute to the waiting experience.

## Artwork Types

- ▶ Stand-alone nodal artworks;
- ▶ Arbour treatments;
- ▶ Coloured, sandblasted or inlaid concrete paving;
- ▶ Informal sculptural seating;
- ▶ Interpretive signage and text elements;

## Budget

50% of the overall station art budget

## Procurement Method

The development of line wide integrated landscape elements may be achieved by:

- ▶ Open Competition
- ▶ 'Design only' elements developed as line wide themes through Noongar Design Workshops

 Art Zone



### Curatorial Vision

Integrated into the fabric of the station building, the artworks will be ‘value added’ elements that can be appreciated from multiple external vantage points, including the Kiss and Ride, Welcome Place, car parks, bus interchanges, pathways and landscaped spaces.

They artworks may be experienced when approaching the building from a distance or internally as part of the vertical circulation. They may include screening treatments to the entry building facades and concourse glass balustrading.

The approach may be line-wide, emphasising the connections between stations or a more localised response to the Malaga site and the surrounding environment.



### Artwork Intention

Integrated landscape elements are part of the line-wide approach that explores shared themes and narratives across stations.

Artworks may be large-scale or fine-grained expressions of place that build a community identity. They can:

- ▶ Provide common elements and thematic connections between stations;
- ▶ Celebrate local culture, history and stories;
- ▶ Enrich the user experience by providing arrival experiences and assisting with wayfinding.

### Scale

- ▶ Large to medium scale integrated elements that may extend over large areas;
- ▶ Fine grained elements of patterned and texture.

### Artwork Types

- ▶ Fritted glass;
- ▶ Perforated metal screens;
- ▶ Interpretive signage and text elements.

### Budget

45% of the overall station art budget

### Procurement Method

The development of line wide integrated architectural elements may be achieved by:

- ▶ Open Competition
- ▶ ‘Design only’ elements developed as line wide themes through Noongar Design Workshops

 Art Zone

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## REFERENCES

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The following documents and websites have been referenced in the preparation of the Plan:

- ▶ METRONET Public Art Strategy
- ▶ METRONET Morley-Ellenbrook Line Public Art Guide
- ▶ METRONET Aboriginal Engagement Strategy (Gnarla Biddi)
- ▶ METRONET Noongar Cultural Context - Gyinning/Morley-Ellenbrook Line
- ▶ METRONET Station Precinct Guide
- ▶ Ellenbrook Station - Preliminary Place Plan (Place Laboratory)
- ▶ City of Swan - Ellenbrook Local Area Plan
- ▶ City of Swan - Growth Corridor Local Area Plan
- ▶ Whiteman Park Station Station - Preliminary Place Plan (Place Laboratory)
- ▶ Whiteman Park Strategic Plan 2017-2021 (Department of Planning)
- ▶ <https://www.whitemanpark.com.au/>
- ▶ <https://www.bushlandperth.org.au/treasures/whiteman-park/>
- ▶ Malaga Station - Preliminary Place Plan (Place Laboratory)
- ▶ City of Swan - Malaga Local Area Plan
- ▶ City of Swan - Ballajura Local Area Plan
- ▶ Beeralain/Bayswater - Station Precinct Placemaking Plan (UDLA and Apparatus)
- ▶ <https://www.noongarculture.org.au/>