PTA TELECOMMUNICATIONS INFRASTRUCTURE

Site 13 - West Leederville

Development Application

Prepared for

UGL/PTA

URBIS

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

Director	Peter Fitzgerald
Senior Consultant	Jackson Tomich
Senior Consultant	Rachel Tu
Project Code	P0043114
Report Number	Rev 1.0

Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices, the Traditional Owners on whose land we stand.

urbis.com.au

CONTENTS

FIGURES

TABLES

1. INTRODUCTION

1.1. PROJECT OVERVIEW

The PTA is investing in Perth's future transport needs by upgrading the existing rail network's radio system to an integrated communications-based train control system, which will be delivered as part of the METRONET High-Capacity Signalling program. High-Capacity Signalling will be delivered in stages over the next 10 years and will ensure a more efficient rail network for Perth's growing population by providing safer, more reliable, and flexible train operations.

The current analogue radio system, developed in the 1990s, is nearing the end of its lifespan and replacement parts are becoming difficult to source. The Radio Systems Replacement (**RSR**) project is an important part of the High-Capacity Signalling program and will ensure that the PTA can continue to provide reliable and effective radio communications to support the safe and efficient operation of the railway network, both now and in the future.

New infrastructure will be delivered under the RSR project at approximately 115 sites across the rail network, including 68 antenna support structures (monopoles), 10km of tunnel antenna cable inside existing rail tunnels and more than 110km of new fibre optic cables.

UGL Limited has been engaged to undertake design and construction for the physical infrastructure for the RSR project on behalf of the PTA.

A separate contract has been awarded to Nokia Solutions and Networks Australia for the design, construction, and maintenance of the technology component (e.g., antennas) for the RSR project.

Design for the physical infrastructure has commenced and construction is expected to begin in late 2023. The new digital radio system is expected to enter service in phases from 2025.

1.2. PURPOSE OF THIS REPORT

This report has been prepared in relation to the physical infrastructure for the RSR project and is limited to the contract scope of work awarded to UGL. This report is only associated with those works which require planning approval as they are not exempt under various legislation (see **section 4** of this report). A separate 'exemption report' has been lodged with DPLH which outlines the full extent of work proposed.

This report provides details of the proposed development located within the Subiaco Redevelopment Area which was a former rail reserve prior to being declared a redevelopment area.

The purpose of this report is to identify, describe and document the associated works for the aforementioned site and seek approval by DevelopmentWA under the Subiaco Redevelopment Scheme 2 for these works.

The report provides appropriate detail and justification regarding the proposed works in a planning context to provide assurance to DevelopmentWA that the proposed works are appropriate in this locality and are consistent with all relevant planning laws and other legislation.

1.3. METROPOLITAN REDEVELOPMENT AUTHORITY APPROVAL

Clause 63(2) of the Metropolitan Redevelopment Authority Act 2011 acknowledges:

> *"A person who undertakes any development on land to which an approved redevelopment scheme applies, or causes any such development to be undertaken, commits an offence unless the development is authorised by a development approval."*

Notwithstanding, Clause 5 of the Metropolitan Redevelopment Authority Regulations 2011 acknowledges:

> *The following works, acts and activities do not constitute development in a redevelopment area for the purposes of the definition of **development** in section 3 —*
>
> *(a) the erection of a traffic control sign or device by a public authority or a local government*

Although the proposed development may be considered exempt under Clause 5 of the Regulations, DevelopmentWA has advised that development approval will be required for Site 13 – West Leederville.

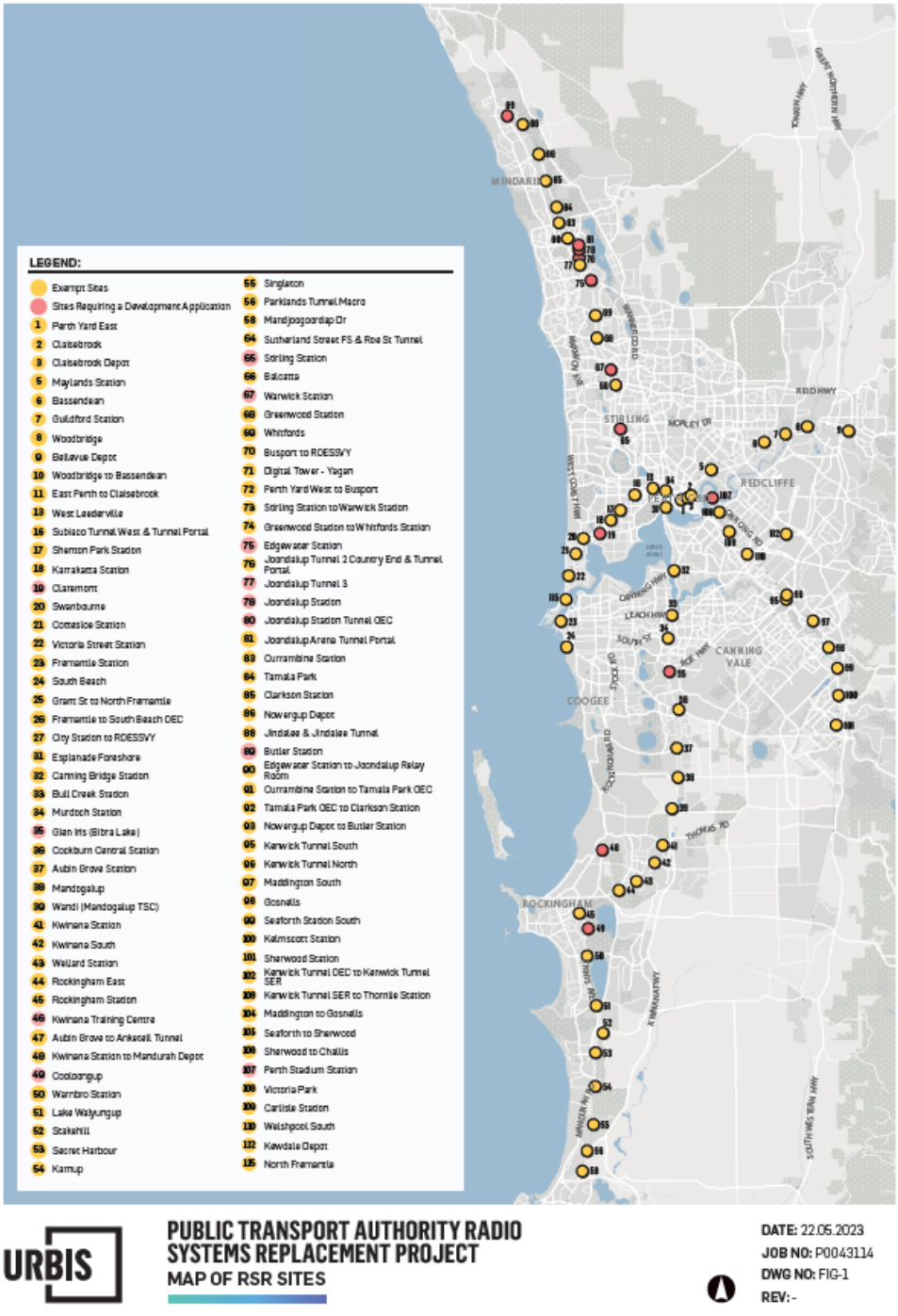
This report provides details of the proposed infrastructure associated with telecommunication infrastructure upgrades to support Transperth's train operations, compliance with the relevant planning framework and seeks approval for the proposed development from DevelopmentWA.

2. BACKGROUND

This report follows an exemption report previously submitted to the Department of Planning Lands and Heritage (**DPLH**), for the same infrastructure project. Of the total 115 sites (**Figure 1** refers), this report relates only to one (1) site located within the Subiaco Redevelopment Area which requires development approval by the WAPC and/or DevelopmentWA, as identified in section 2.1 below, with the site number being consistent with that used in the exemption report.

As discussed in a pre-lodgement meeting with DPLH and DevelopmentWA, we have focused on key land use and amenity issues rather than technical detail of the infrastructure and its operation. This is appropriate in the context of the proposed infrastructure will be replacing existing infrastructure. The proposed infrastructure will purely service the PTA network and does not form part of any commercial telecommunications network.

Figure 1 - Entire RSR Network



2.1. LOT PARTICULARS

The lot particulars of the sites the subject of this application are described in **Table 1**. All sites are within or abutting existing rail infrastructure. **Appendix A** refers to the Certificate of Title.

Table 1 - Lot Particulars

Site No.	Site Name	Lot	Plan/Diagram	Vol/Folio	Proprietor
13	West Leederville	100	54404	2162/986	Commissioner of Railways

2.2. SITE CONTEXT

Site 13 – West Leederville is located 70m (approx.) east of Hamilton Street (West Leederville) on the southern side of the Fremantle – Midland rail line. The site is completely cleared of vegetation, with reduced topography and mature vegetation providing natural screening to the surrounding streetscape, as shown in **Figure 2**.

Figure 2 – 3D context with site shown in red (source: Google maps)

2.2.1. Site No. 13 – West Leederville, Subiaco Redevelopment Area

The following figures reflect the proposed location on site No. 13 and its relevant zonings.

Figure 3 – Site No. 13 Aerial

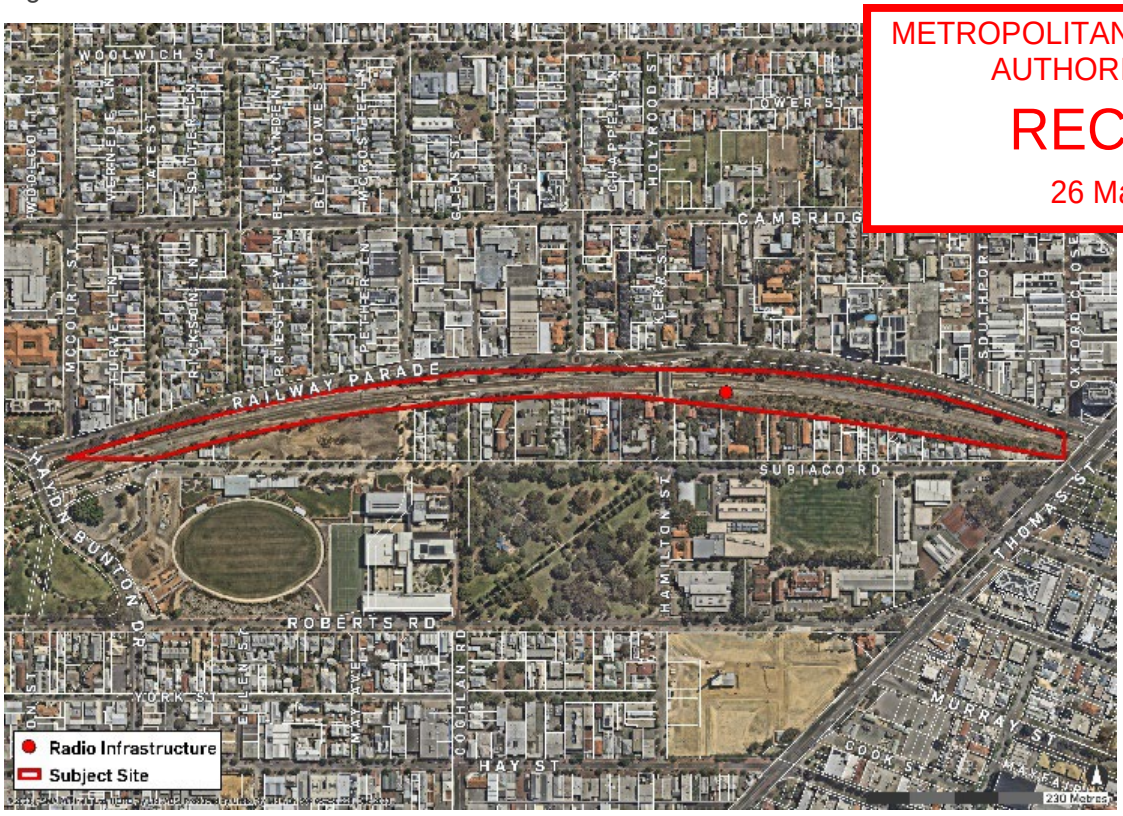


Figure 4 - Site No. 13 Close up (Lat -31.942772, Long 115.836669)

Figure 5 - Site No. 13 MRS zoning map

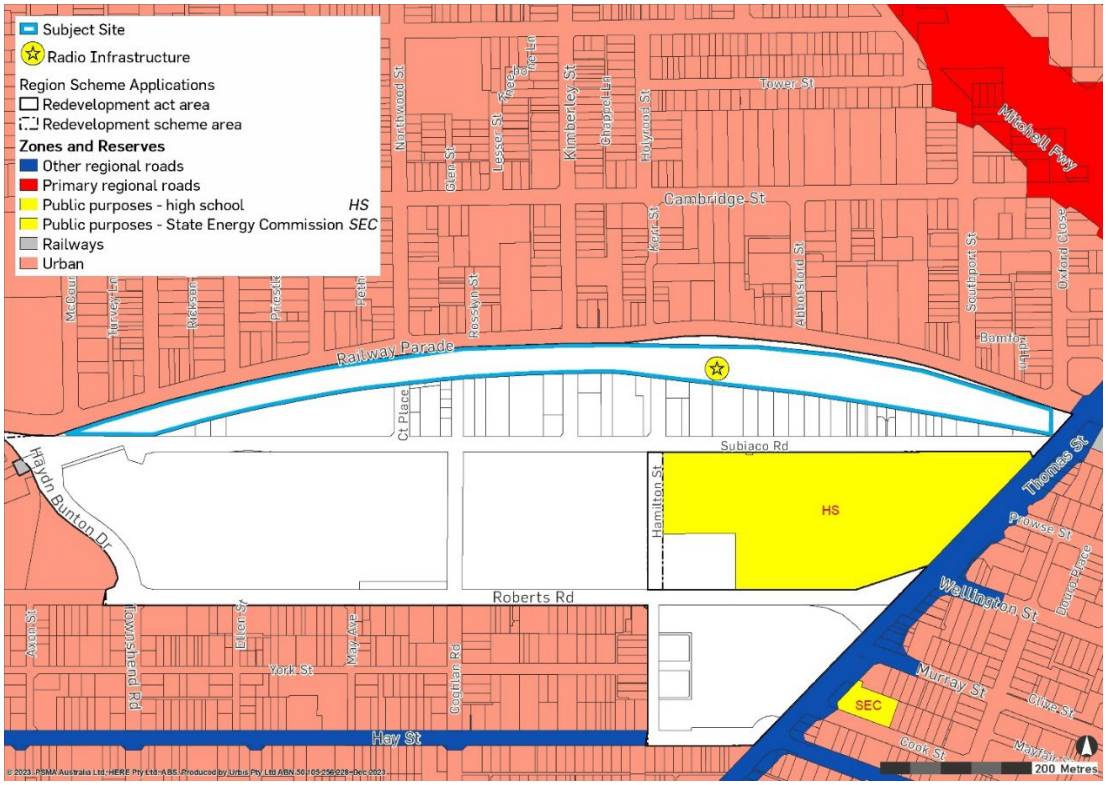
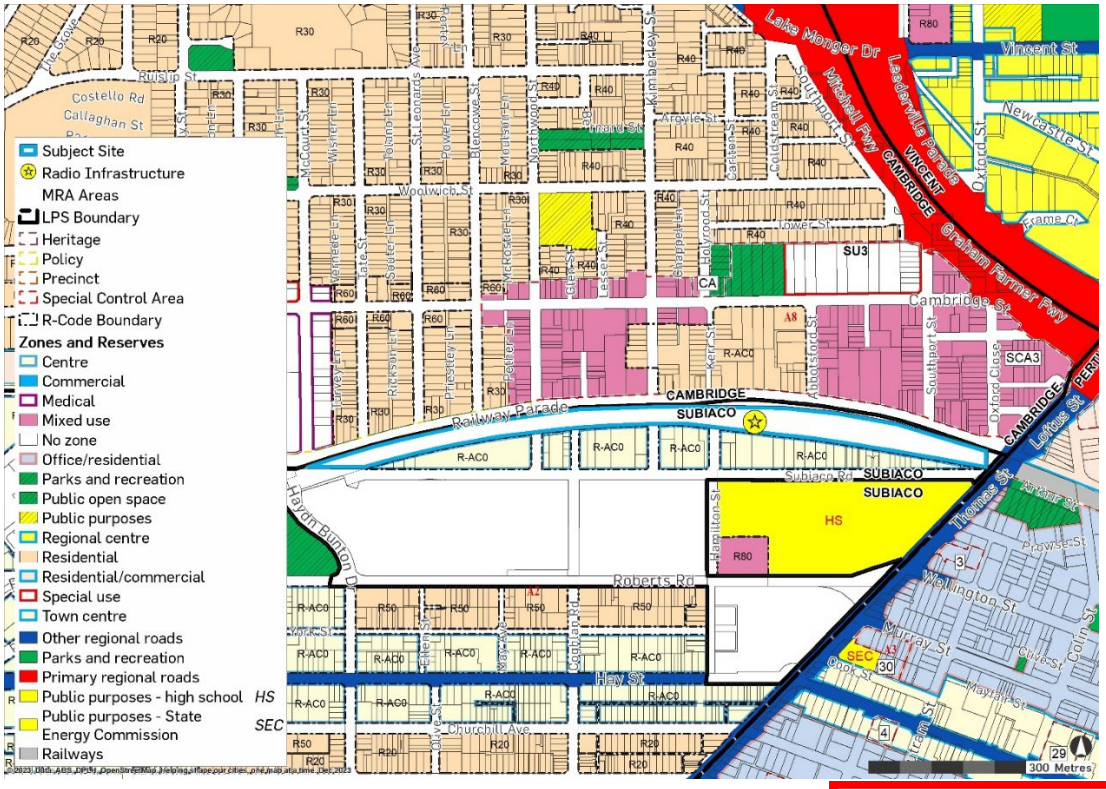


Figure 6 - Site No. 13 City of Subiaco LPS No. 5 zoning map



3. PROPOSAL

3.1. MAIN SCOPE OF WORKS

With reference to the plans at **Appendix B**, the following **Table 2** summarises the main components of the proposed works. Minor associated works may also be required as part of detailed design of the communications infrastructure. Works is taking place in a low impact area in proximity to the railway, being the best location for the signal. The infrastructure is also low impact, consisting of a box and monopole.

The METRONET High-Capacity Signalling: Radio Systems Replacement Fact Sheet is located in **Appendix C** to provide further commentary on the technology and purpose of the proposed works.

Table 2 - Summary of Main Project Works

MAIN PROJECT WORKS	SUMMARY
Permanent Works – Above Ground	
▪ Antenna Support Structures (fixed or hinged monopoles) ▪ Foundations for Antenna Support Structures ▪ Hardstands for maintenance of each hinged monopole ▪ Civil works, including: o Bollards o Fencing and gates o Hardstand o Kerbing o Paving o Retaining wall o Cut and fill o Drainage o Signage	
Permanent Works – Below Ground	
Fibre Optical Cable Connections do not relate to a specific geographical site, rather are connected to a route to install cable. The fibre optic cable relating to the subject sites will either be connected to an existing PTA cable route or will be part of a new route installation as part of the monopole construction.	

NB: Temporary fencing/site control will be required during construction but no impact to site operation.

3.2. TECHNICAL CONSIDERATIONS

3.2.1. Amenity Considerations

The site selection process has identified specific locations that will not impact on the amenity of the surrounding area. This site is specifically located within the boundaries of a rail reserve is consistent with the community expectations around use and development, including visual amenity. Further to this, the infrastructure is located on the lower topography and is screened by nature vegetation from adjoining

properties, ensuring there is minimal visual impact. Any noise or vibrations related to the installation of the PTA infrastructure will be temporary in nature and within acceptable levels.

4. RELEVANT LEGISLATION

The proposed development involves the rollout of infrastructure at some 115 sites across the Metropolitan Region, however most of these sites are associated with works on reserved land which are exempt from approval under both the Metropolitan Region Scheme and Local Planning Schemes.

As part of our initial review Urbis have considered exemptions and requirements under the *Railway (Metronet) Act 2018, Planning and Development Act 2005, Metropolitan Redevelopment Act 2011* and the *Subiaco Redevelopment Scheme 2.*

Although the proposed development is considered '*public works*' under Section 6 of the Planning and Development Act 2005 (**PD Act**), those which are proposed within a Metropolitan Redevelopment Area require approval under the Metropolitan Redevelopment Act 2011. As such, this development application seeks development approval from DevelopmentWA.

5. STATE PLANNING FRAMEWORK

5.1. STATE PLANNING FRAMEWORK

The following assessment confirms the proposed infrastructure is consistent with the relevant State Planning Framework.

5.1.1. Subiaco Redevelopment Scheme 2

The Subiaco Redevelopment Scheme 2 (SRS2) is a legislative document which the Redevelopment Act requires the Authority to prepare. The Scheme sets out the provisions for the development and use of land within the Scheme Area and enables the preparation of statutory planning tools. The Scheme is the Authority's most important document for managing the development of land within the Subi-East area.

The proposed development is located within Precinct 3 – Railway of the redevelopment area, within a former railway reserve and adjacent a well utilised railway line.

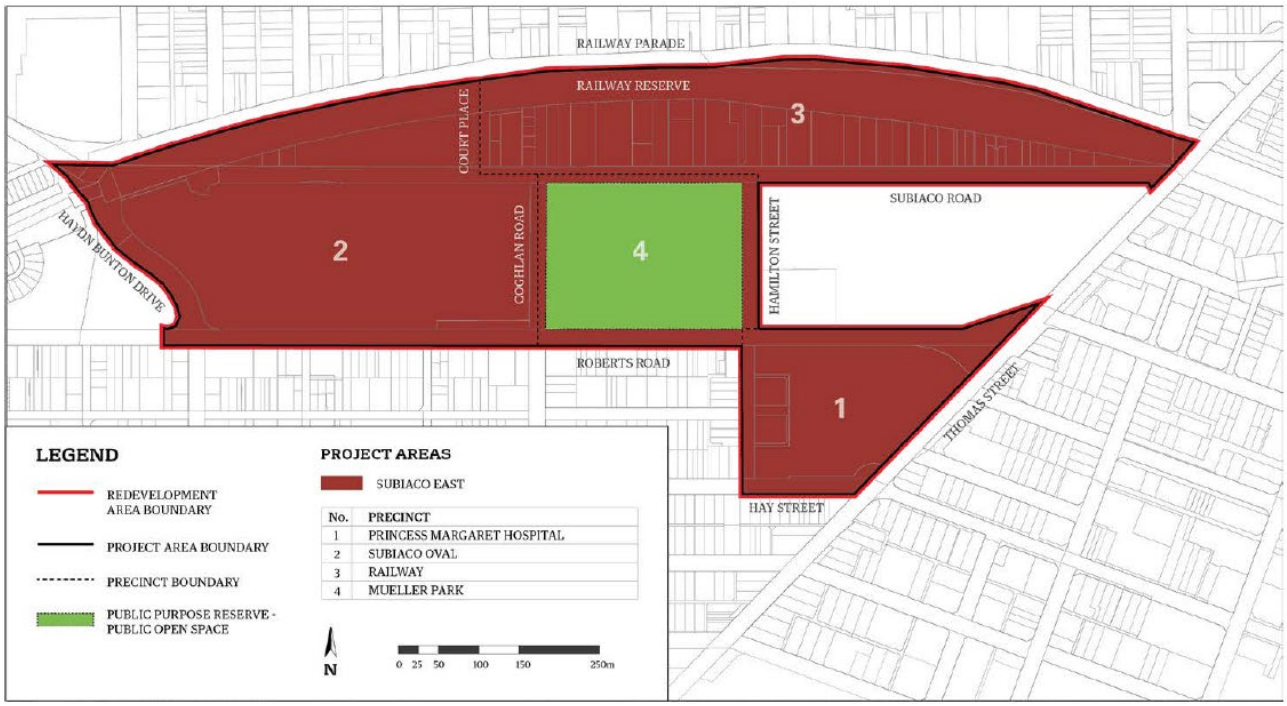
The proposed telecommunication infrastructure does not fit neatly into one of the seven land use categories of SRS2, however it could be considered "*Category 6 – Community*", which is defined as:

> *Premises or land uses which provide essential services or leisure facilities to local residential and workers or the wider community, also referred to as 'social infrastructure'. May include activities for commercial gain which provide social benefit.*

Community land use is a "Preferred" land use within Precinct 3 – Railway, meaning the proposed development may be approved.

The proposed development may also be considered a '*use not listed*' and assessed based on the objectives of the SRS2 and principles of orderly and proper planning. The proposed development and location are considered entirely appropriate, with no significant impacts to the local amenity or surrounding streetscape.

Figure 7 – Subiaco East Project Map Area



5.1.2. State Planning Policy 5.2 – Telecommunications Infrastructure

The overall intent of State Planning Policy 5.2 (**SPP5.2**) is to ensure the effective roll out of telecommunications infrastructure without compromising the amenity or visual impacts of surrounding uses. The objectives of the policy are outlined below:

> *a) facilitate the provision of telecommunications infrastructure in an efficient and environmentally responsible manner to meet community needs;*
>
> *b) manage the environmental, cultural heritage, visual and social impacts of telecommunications infrastructure;*
>
> *c) ensure that telecommunications infrastructure is included in relevant planning processes as essential infrastructure for business, personal and emergency reasons; and,*
>
> *d) promote a consistent approach in the preparation, assessment and determination of planning decisions for telecommunications infrastructure.*

The proposal is aligned with the objectives of the SPP 5.2 as it balances the provisions of vital infrastructure while minimising the impacts to adjoining land uses. This is further demonstrated in the assessment of the proposals against the policy measures in **Table 3** below.

Table 3 - SPP5.2 Assessment

Clause 5 - Policy Measures	**Proposal's Compliance**
5.1 Visual Impacts Assessment of the visual impact of development proposals for telecommunications infrastructure should be made on a case-by-case basis	Based on pre-lodgement discussions a Visual Impact Assessment is not considered necessary for the proposal as the site is located within land which is already used for railways and road transport. The proposed infrastructure location is located within a former railway reserve and adjacent to a well utilised railway line and has been carefully identified to minimise any visual impact to this locality.
5.1.1 The benefit of improved telecommunications services should be balanced with the visual impact on the surrounding area. Telecommunications infrastructure should be sited and designed to minimise visual impact and whenever possible: • be located where it will not be prominently visible from significant viewing locations such as scenic routes, lookouts and recreation sites; • be located to avoid detracting from a significant view of a heritage item or place, a landmark, a streetscape, vista or a panorama, whether viewed from public or private land; • not be located on sites where environmental, cultural heritage, social and	As noted above, the proposed infrastructure is located within land that is already used for rail transportation and will not impact on the local amenity. The site and nature of the infrastructure will not detract from significant scenic outlooks, heritage items or recreation sites. The design of the proposed infrastructure will reflect existing PTA infrastructure, colours and finishes will by sympathetic to the surrounding context.

Clause 5 - Policy Measures	Proposal's Compliance
visual landscape values maybe compromised and • display design features, including scale, materials, external colours and finishes that are sympathetic to the surrounding landscape;	
In addition to the existing exemptions under the Telecommunication Act, local governments should consider exempting telecommunications infrastructure from the requirement for development approval where: The infrastructure has a maximum height of 30 metres from finished ground level; The proposal complies with the policy measures outlined in this policy; and The proponent has undertaken notification of the proposal in a similar manner to 'low impact facilities' as defined and set out in the Mobile Phone Base Station Deployment Industry Code (C564:2011);	The proposed infrastructure is exempt from Local Government approval however, the Local Government has been consulted prior to the lodgement of this application with no significant issues identified. The application has been considered against the relevant planning framework see **Section 5.2**. Additionally, the proposed infrastructure has a height of 30m. SPP 5.2 considers infrastructure with a height of 30m to be exempt from requiring development approval.
Telecommunications infrastructure should be located where it will facilitate continuous network coverage and/or improved telecommunications services to the community; and	The location of the proposed infrastructure has been determined to ensure maximum telecommunication coverage of the PTA radio system across its passenger rail network, which ultimately services the community
Telecommunications infrastructure should be co-located and whenever possible: Cables and lines should be located within an existing underground conduit or duct; and Overhead lines and towers should be co-located with existing infrastructure and/or within existing infrastructure corridors and/or mounted on existing or proposed buildings.	Co-location is not considered relevant in the context of this application as the proposed infrastructure is not part of a commercial operator. However, the policy's intent warrants consideration for the future development in the area. See the development plans (**Appendix B**) for further detail.

5.2. SUBIACO REDEVELOPMENT AREA DEVELOPMENT POLICIES

5.2.1. Development Policy 5 – Additional Structures

This policy clarifies when proposals for additional structures require development approval and provides performance standards to guide the assessment of development applications when development approval is required.

Policy provision 4 sets out the performance standards for development approval, with an assessment of the proposed development against the performance standards in **Table 4** below.

Table 4 – DP5 Assessment

Performance Standard	Proposed Development
P1. The additional structure improves the amenity of the property by: • enhancing the enjoyment, use or environmental sustainability of the property; • being compatible with the design, character, materials and colour scheme of the existing building; and • demonstrating an appropriate level of restraint in scale, bulk and collective number of additional structures on the site.	The proposed development will improve the amenity by: • enhancing the use of the railway infrastructure. • being compatible with the existing railway infrastructure. • restricting the number of High-Capacity Signalling Towers within the Subiaco Redevelopment Area to one.
P2. The additional structure supports the amenity of surrounding properties and the public realm by: • being appropriately located and positioned on the building or site with intrusive structures located towards the rear of the site or obscured from view; • equipment and infrastructure being integrated into the design of the building or appropriately screened; and • prioritising the activation and safety of the public realm by maintaining visual permeability of windows and boundary structures at street level.	The proposed development supports the amenity of the surrounding properties and the public realm by: • being located in an area that is screened from view by mature vegetation and existing topography.
P3. The additional structure supports the Authority's vision for the relevant locality by: • being consistent with the residential or business activity of the site; and • being compatible with the intended character and amenity of the streetscape and public realm of the area.	The proposed development supports the Authority's vision for the locality by: • being a preferred land use for this location. • Being compatible with the intended character and amenity of the streetscape and public realm for this locality.

6. CONCLUSION

The PTA is investing in Perth's future transport needs by upgrading the existing rail network's radio system to an integrated communications-based train control system, which will be delivered as part of the METRONET High-Capacity Signalling program. High-Capacity Signalling will be delivered in stages over the next 10 years and will ensure a more efficient rail network for Perth's growing population by providing safer, more reliable, and flexible train operations.

The current analogue radio system, developed in the 1990s, is nearing the end of its lifespan and replacement parts are becoming difficult to source. The Radio Systems Replacement (RSR) project is an important part of the High-Capacity Signalling program and will ensure that the PTA can continue to provide reliable and effective radio communications to support the safe and efficient operation of the railway network, both now and in the future.

New infrastructure will be delivered under the RSR project at approximately 115 sites across the rail network, including 68 antenna support structures (monopoles), 10km of tunnel antenna cable inside existing rail tunnels and more than 110km of new fibre optic cables.

This report provides appropriate detail and justification regarding the proposed works in a planning context to provide assurance to DevelopmentWA that the works are appropriate and consider all relevant planning laws and other legislation.

It is respectfully requested that DevelopmentWA grant planning approval for the proposed infrastructure at **Site 13 – West Leederville**, as identified in this application.

7. DISCLAIMER

This report is dated 7 December 2023 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 UGL/PTA **(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 B DEVELOPMENT PLANS

FREMANTLE LINE - WEST LEEDERVILLE - SP2.013

DRAWING No	SHEET No	DESCRIPTION	DRAWING No	SHEET No	DESCRIPTION
		04 - MOBILE RADIO SYSTEM			
13-T-04-0039	1	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - DRAWING INDEX			
13-T-04-0040	2	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - CONSTRUCTION METHODOLOGY AND LOCALITY PLAN			
13-T-04-0042	3	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - SITE PLAN OVERVIEW			
13-T-04-0043	4	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - SITE ELEVATION			
13-T-04-0046	5	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - UNDERGROUND SERVICES PLAN			
13-T-04-0060	6	WEST LEEDERVILLE - MOBILE RADIO SYSTEM - LV ELECTRICAL POWER SUPPLY CABLE BLOCK DIAGRAM			

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	13.12.23	PRELIMINARY DESIGN	AAL	RJV		

ORIG SIZE A1

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

UGL

REFERENCES

SCALE N/A

DATUM
HORIZONTAL: N/A
VERTICAL: N/A

DESIGNED A.AL-DUJAILI
DRAWN R.VARNAVIDES
CHECKED
APPROVED
DATE

Government of Western Australia Public Transport Authority

RADIO SYSTEMS REPLACEMENT

WEST LEEDERVILLE
MOBILE RADIO SYSTEM
DRAWING INDEX

PTA Drawing No: 13-T-04-0039 Rev: A

CAD DRAWING PATHNAME C:\Users\paula.morgan\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0039.dwg

LOCALITY PLAN
SCALE: 1:250

LEGEND

PREFERRED SITE ACCESS PATH

MONOPOLE LOCATION

OVERALL CONSTRUCTION ACTIVITIES FOOTPRINT

CADASTRAL

LAY-DOWN/STORAGE AREA & MONOPOLE CONSTRUCTION ZONE

COORDINATES OF PROPOSED ASS MONOPOLE (PCG2020)	
EASTING	NORTHING
51891.4164	364498.2722

SITE SPECIFICATION:

HINGED MONOPOLE HEIGHT: 25m

SCENARIO TYPE: SCENARIO 2A

CONSTRUCTION METHODOLOGY

CONSTRUCTION WORKS TO BE COMPLETED IN TWO PHASES.

PHASE 1: INCLUDING BUT NOT LIMITED TO: MOBILISATION OF PLANT AND EQUIPMENT, PREPARATION AND CONSTRUCTION WORKS, E.G. FOUNDATION WORK, CABLE TRENCHING, CONCRETE POURING, AND ELECTRICAL INSTALLATIONS.

PHASE 2: INCLUDING BUT NOT LIMITED TO: MONOPOLE DELIVERY, ASSEMBLY, ERECTION, INSPECTIONS AND TESTING.

GENERAL NOTES

1. TRAFFIC MANAGEMENT IS INDICATIVE ONLY AND SUBJECT TO CHANGE PENDING TRAFFIC MANAGEMENT PLAN DEVELOPMENT.

2. ROAD CLOSURE AND SITE SETUP TO BE MOBILISED/DEMOBILISED AS REQUIRED BETWEEN CONSTRUCTION PHASES.

3. WHERE SAFETY HAZARDS ARE PRESENT, TEMPORARY FENCING TO BE INSTALLED AS REQUIRED BETWEEN CONSTRUCTION PHASES.

METROPOLITAN REDEVELOPMENT AUTHORITY ACT 2011
RECEIVED
26 March 2024

0 2.5 5.0 7.5 10.0 12.5 25.0m
SCALE 1:250

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	03.01.24	PRELIMINARY DESIGN	AAL	RJV		

ORIG SIZE A1

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

UGL

REFERENCES
Cadastral Boundaries
XR13T_Aerial_20230928

SCALE 1:250

DATUM
HORIZONTAL: PCG2020
VERTICAL: AHD

DESIGNED A.AL-DUJAILI
DRAWN R.VARNAVIDES
CHECKED
APPROVED
DATE

Government of Western Australia Public Transport Authority

RADIO SYSTEM REPLACEMENT
WEST LEEDERVILLE
MOBILE RADIO SYSTEM
CONSTRUCTION METHODOLOGY & LOCALITY PLAN

PTA Drawing No: 13-T-04-0040 Rev: A

CAD DRAWING PATHNAME C:\Users\riley.varnavides\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0040.dwg

SITE PLAN OVERVIEW
SCALE: 1:200

LEGEND

(EXISTING)

- ROAD - EDGE OF SEAL
- COMMUNICATIONS
- POWER - LOW VOLTAGE
- CADASTRAL
- CONCRETE SLAB
- BUILDING
- RETAINING WALL
- FENCE
- FENCE GATE
- POWER PIT
- COMMUNICATIONS PIT
- CONTOURS (0.2m INTERVALS)
- POWER LIGHT POLE
- EARTH ROD PIT
- SITE MAIN SWITCHBOARD (SMSB)

(PROPOSED)

- LIMESTONE TRACK
- BITUMEN HARDSTAND
- COMMUNICATIONS CONDUIT
- FENCE
- FENCE GATE
- RETAINING WALL
- EARTHING CABLE
- 1200mm PIT
- BOLLARD

NOTES:

1. DRAWING DIMENSIONS IN METRES UNLESS NOTED OTHERWISE (U.N.O)
2. NOT ALL SERVICES SHOWN FOR CLARITY OF DRAWING
3. ALL PROPOSED CABLE ROUTE ARRANGEMENT TO BE MINOR CABLE ROUTE

METROPOLITAN REDEVELOPMENT AUTHORITY ACT 2011
RECEIVED
26 March 2024

0 2 4 6 8 10 20m
SCALE 1:200

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	13.12.23	PRELIMINARY DESIGN	AAL	RJV		

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

UGL

REFERENCES
XR13T_Survey2D_20230928
XR13T_Aerial_20230928
XR13T_Design_20230928
Cadastral Boundaries

SCALE 1:200

DATUM
HORIZONTAL: PCG2020
VERTICAL: AHD

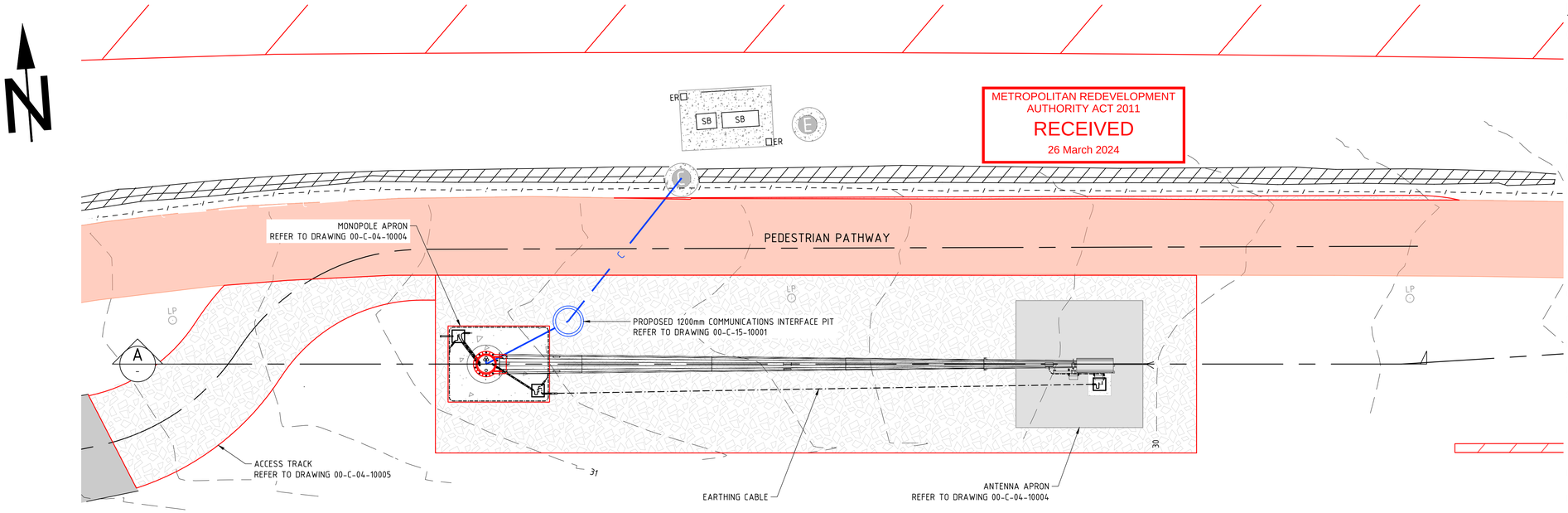
DESIGNED A.AL-DUJAILI
DRAWN R.VARNAVIDES
CHECKED
APPROVED
DATE

Government of Western Australia Public Transport Authority

RADIO SYSTEM REPLACEMENT
WEST LEEDERVILLE
MOBILE RADIO SYSTEM
SITE PLAN OVERVIEW

PTA Drawing No: 13-T-04-0042 Rev: A

CAD DRAWING PATHNAME C:\Users\paula.morgan\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0042.dwg



SITE PLAN
SCALE: 1:100

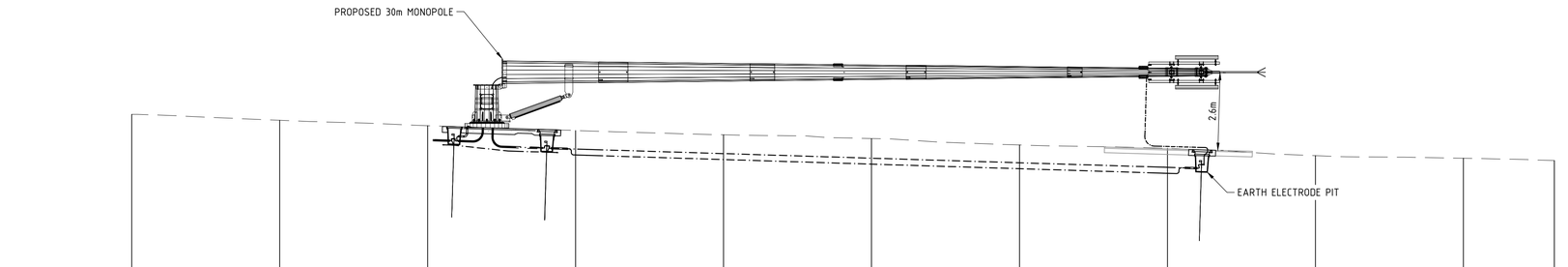
LEGEND

(EXISTING)
- ROAD - EDGE OF SEAL
- CADASTRAL
- BITUMEN - BLACK
- FOOTPATH - RED ASPHALT
- CONCRETE SLAB
- BUILDING
- RETAINING WALL
- FENCE
- POWER PIT (E)
- COMMUNICATIONS PIT (C)
- CONTOURS (0.2m INTERVALS) 99
- POWER LIGHT POLE LP
- EARTH ROD PIT ER
- SITE MAIN SWITCHBOARD (SMSB) SB

(PROPOSED)
- LIMESTONE TRACK
- BITUMEN HARDSTAND
- EDGE OF TRACK
- ROAD - CENTRELINE
- COMMUNICATIONS (C)
- RETAINING WALL
- EARTHING CABLE

NOTES:

1. DRAWING DIMENSIONS IN METRES UNLESS NOTED OTHERWISE (U.N.O)
2. NOT ALL SERVICES SHOWN FOR CLARITY OF DRAWING
3. ALL PROPOSED CABLE ROUTE ARRANGEMENT TO BE MINOR CABLE ROUTE



DATUM RL: 23.00

NATURAL SURFACE	31.33	31.13	30.95	30.78	30.64	30.51	30.30	30.18	29.94	29.85	29.77
CHAINAGE	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	48.07

SECTION A
SCALE: 1:100

0 1 2 3 4 5 10m
SCALE 1:100

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	11.01.24	PRELIMINARY DESIGN	AAL	RJV		

ORIG SIZE A1

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

UGL

REFERENCES
XR13T_Survey2D_20230928
XR13T_Design_20230928
Cadastral Boundaries

SCALE 1:100

DATUM
HORIZONTAL: PCG2020
VERTICAL: AHD

DESIGNED A.AL-DUJAILI
DRAWN R.VARNAVIDES
CHECKED
APPROVED
DATE

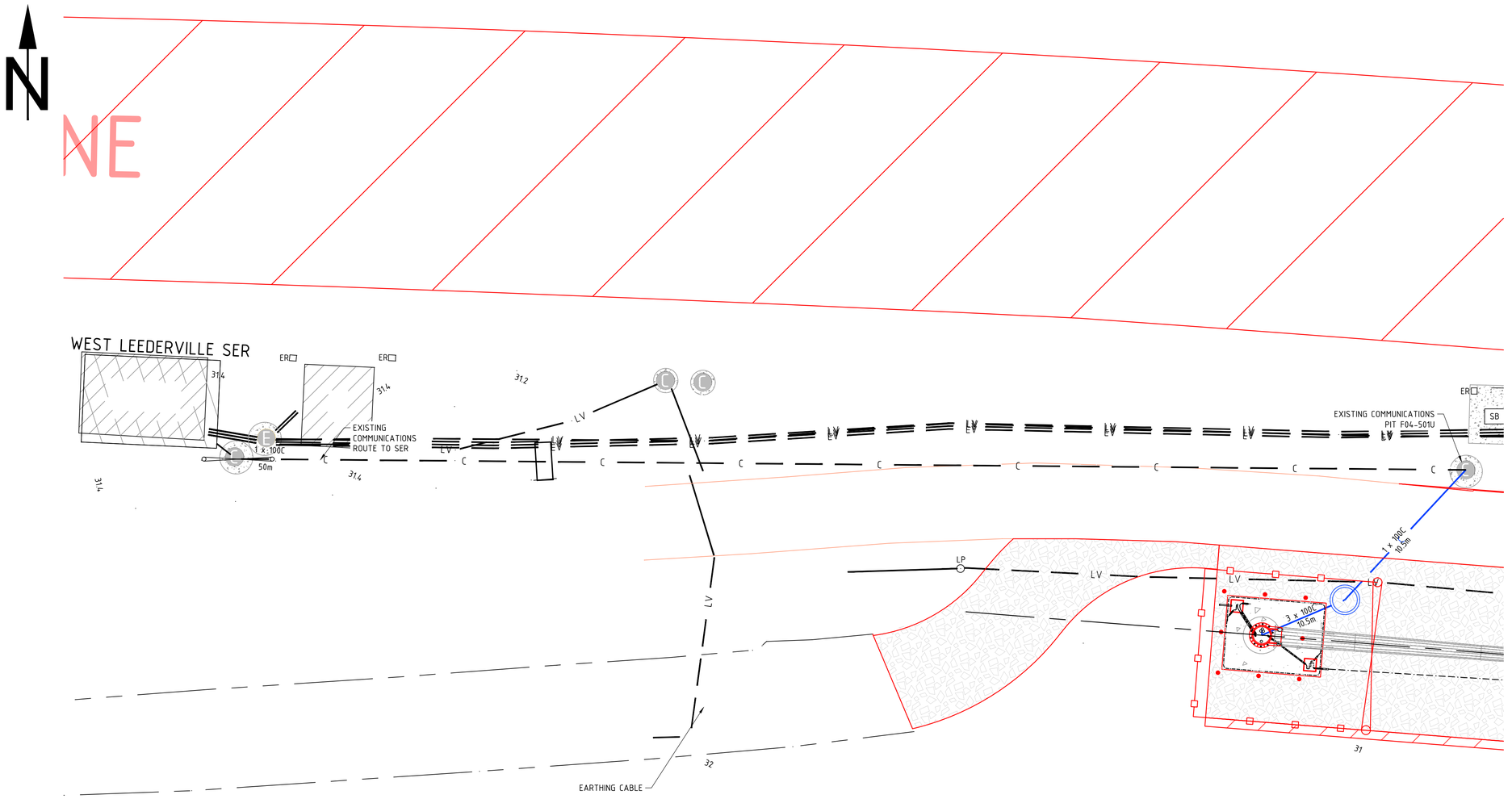
Government of Western Australia Public Transport Authority

RADIO SYSTEM REPLACEMENT

WEST LEEDERVILLE
MOBILE RADIO SYSTEM
SITE ELEVATION

PTA Drawing No: 13-T-04-0043 Rev: A

CAD DRAWING PATHNAME C:\Users\riley.varnavides\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0043.dwg



LEGEND

(EXISTING)

- ROAD - EDGE OF SEAL
- COMMUNICATIONS (C)
- POWER - LOW VOLTAGE (LV)
- CADASTRAL
- FOOTPATH
- CONCRETE SLAB
- BUILDING
- POWER PIT (E)
- COMMUNICATIONS PIT (C)
- CONTOURS (0.2m INTERVALS) (99)
- POWER LIGHT POLE (LP)
- EARTH ROD PIT (ER)
- SITE MAIN SWITCHBOARD (SMSB) (SB)

(PROPOSED)

- LIMESTONE TRACK
- EDGE OF TRACK
- COMMUNICATIONS (C)
- FENCE
- RETAINING WALL
- FENCE GATE
- EARTHING CABLE
- BOLLARD

NOTES:

1. DRAWING DIMENSIONS IN METRES UNLESS NOTED OTHERWISE (U.N.O)
2. NOT ALL SERVICES SHOWN FOR CLARITY OF DRAWING
3. ALL PROPOSED CABLE ROUTE ARRANGEMENT TO BE MINOR CABLE ROUTE

UNDERGROUND SERVICES PLAN

SCALE: 1:100

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	24.11.23	PRELIMINARY DESIGN	AAL	RJV		

ORIG SIZE A1

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

UGL

REFERENCES
XR13T_Survey2D_20230928
XR13T_Design_20230928

SCALE 1:100

DATUM
HORIZONTAL: PCG2020
VERTICAL: AHD

DESIGNED A.AL-DUJAILI
DRAWN R.VARNAVIDES
CHECKED
APPROVED
DATE

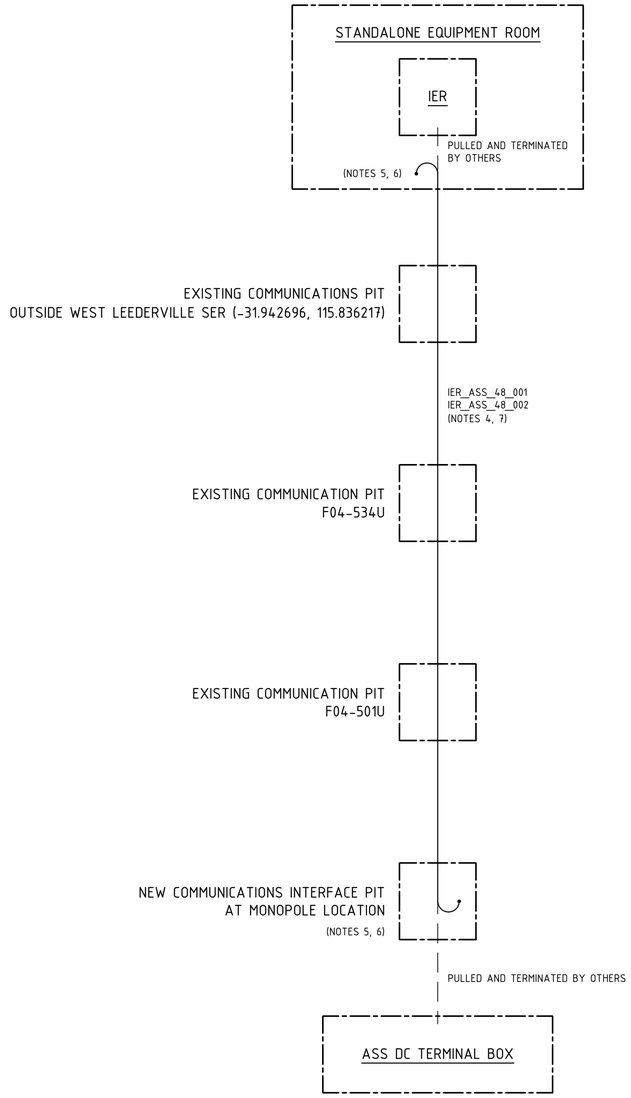
Government of Western Australia Public Transport Authority

RADIO SYSTEM REPLACEMENT

WEST LEEDERVILLE
MOBILE RADIO SYSTEM
UNDERGROUND SERVICES PLAN

PTA Drawing No: 13-T-04-0046 Rev: A

CAD DRAWING PATHNAME C:\Users\paula.morgan\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0046.dwg



LEGEND:

IER INDOOR EQUIPMENT RACK

SER STANDALONE EQUIPMENT ROOM

NOTES:

1. ALL POWER AND EARTH CABLES SHALL CONSIST OF STRANDED COPPER CONDUCTORS, SIZE AND INSULATION TYPES AS NOMINATED.
2. PROVIDE CABLE LABELS ON ALL CABLES TO MEET THE REQUIREMENTS OF PTA DOCUMENT NUMBERS 8103-800-008, 8510-000-011, 8840-000-001 AND 8840-000-002.
3. THE DESIGN AND CONSTRUCTION WORKS SHALL COMPLY WITH THE REQUIREMENTS OF ALL RELEVANT AUSTRALIAN STANDARDS AND REGULATIONS AND ALL APPLICABLE PTA STANDARDS.
4. INSTALL NEW DC CABLE IN EXISTING COMMS CONDUIT BETWEEN SER AND NEW COMMS INTERFACE PIT. COIL ADEQUATE LENGTH OF CABLE IN CABLE LADDER & PIT TO REACH THE IER AND DC TERMINALS AT THE BASE OF THE ASS.
5. CABLE TO BE LEFT UNTERMINATED IN SER CABLE TRAY AT THE IER END AND IN THE NEW COMMUNICATIONS INTERFACE PIT NEAR THE MONOPOLE. THE CABLE SHALL BE TESTED, LABELLED, AND TAGGED "OUT OF SERVICE".
6. THE DC POWER CABLING LEFT FOR TERMINATION BY OTHERS SHALL BE TEMPORARILY SEALED AT THE CABLE ENDS USING SUITABLY RATED CABLE CAPS. CABLE CAPS USED IN EXTERNAL CABLE PITS SHALL BE IP67 RATED.
7. ALL CABLES TO BE INSTALLED VIA AN UNDERGROUND CABLE ROUTE SHALL BE SUPPLIED WITH AN ANTI-TERMITE TREATED SHEATH.
8. THE DC POWER CABLING SHALL BE LABELLED USING METAL LABELS (STAINLESS STEEL OR ALUMINIUM), ENGRAVED WITH THE CABLE IDENTIFICATION AND SECURELY FIXED TO THE CABLE.
9. THE DC POWER CABLING SHALL BE LABELLED AT EACH EXTREMITY OF THE CABLE, AT EACH LOCATION WHERE THE CABLE ENTERS AND LEAVES CABLE TRUNKING, AND AT EVERY MAJOR CABLE PIT IT PASSES THROUGH.

CABLE LABEL	ORIGIN	DESTINATION	CABLE DETAILS	ROUTE LENGTH (m)
IER_ASS_48_001	WEST LEEDERVILLE SER	WEST LEEDERVILLE RSR MONOPOLE (ASS)	0.6/1 kV, 2C, 10mm^2, Cu/PVC/PVC	80
IER_ASS_48_002	WEST LEEDERVILLE SER	WEST LEEDERVILLE RSR MONOPOLE (ASS)	0.6/1 kV, 2C, 10mm^2, Cu/PVC/PVC	80

CABLE SCHEDULE

(EQUIPMENT NAMING AND CABLE LABELS ARE INDICATIVE ONLY. ALL NAMES AND LABELS SHALL BE ALIGNED WITH THE APPROVED ASSET TAGGING DOCUMENTATION)

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
A	09.01.24	PRELIMINARY DESIGN	KJA	PMO		

ORIG SIZE A1

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

REFERENCES

SCALE N/A

DATUM
HORIZONTAL: N/A
VERTICAL: N/A

DESIGNED K.JAMES
DRAWN T.MORGAN
CHECKED
APPROVED
DATE

Government of Western Australia Public Transport Authority

RADIO SYSTEMS REPLACEMENT

WEST LEEDERVILLE
MOBILE RADIO SYSTEM
ELV POWER SUPPLY CABLE BLOCK DIAGRAM

PTA Drawing No: 13-T-04-0060 Rev: A

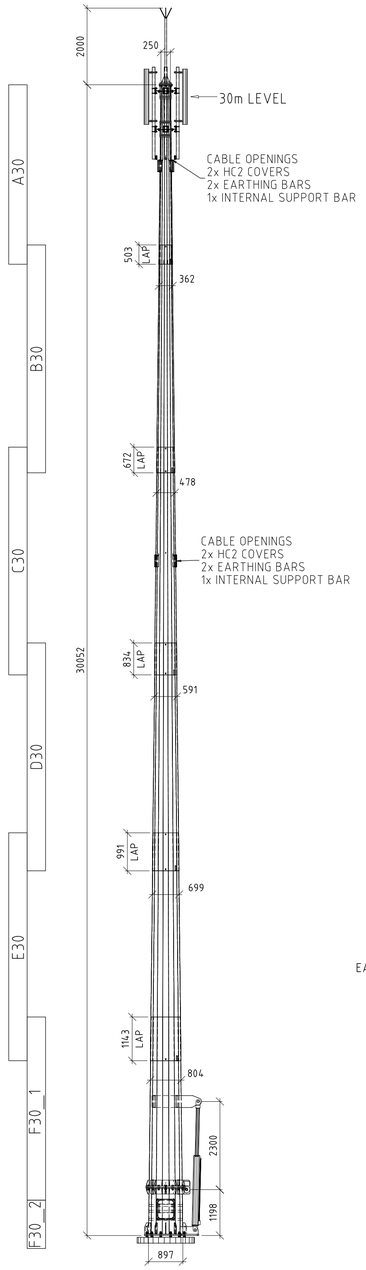
CAD DRAWING PATHNAME C:\Users\paula.morgan\UGL Limited\Radio Systems Replacement (PTA) - Project Documents\D - Design\D6 SP2\SP2.013 West Leederville\1. PD\WIP\13-T-04-0060.dwg

QTY	Description	Assembly	Finish	Supplied by
8	Hexagon bolt AS1111 10x25 - 4.6	NaW	Galvanised	Roam
4	Hexagonal bolt AS1252 12x30 - 8.8	NaW	Galvanised	Roam
2	Hexagonal bolt AS1252 12x60 - 8.8	NaW	Galvanised	Roam
8	Hexagon bolt AS1252 16x60 - 8.8	NaW	Galvanised	Roam
14	Hexagon bolt AS1252 30x110 - 8.8	NaW	Galvanised	Roam

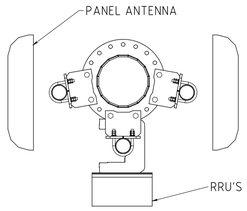
QTY	Item	Description	Finish	Supplied by
12	M30 TP NUT	TAMPER PROOF NUT	Galvanised	Roam
1	ES1	BRAIDED COPPER EARTH STRAP		Roam
2	CRIMP LUG	COPPER CRIMP LUG (M12)		Roam
4	M52x2	EXTERNAL CIRCLIP STAINLESS		Roam

Mark	Qty.	Length	Material	Grade
GJ169-A30	1	4690	6mm PLATE	350
GJ169-ALF1	1	2003	48 CHS 3.5	C350
GJ169-B30	1	5950	6mm PLATE	350
GJ169-C30	1	5950	6mm PLATE	350
GJ169-D30	1	5950	6mm PLATE	350
GJ169-E30	1	5950	6mm PLATE	350
GJ169-F30_1	1	4590	6mm PLATE	350
GJ169-F30_2	1	1420	6mm PLATE	350
GJ169-HC1	1	538	3mm PLATE	350
GJ169-HC2	4	320	3mm PLATE	350
GJ169-LB30	2	170	M30x150	8.8
GJ169-ME1	4	290	50x3mm SQUARE MESH	300+
GJ169-P52	2	112	52mm ROUND BAR	8.8

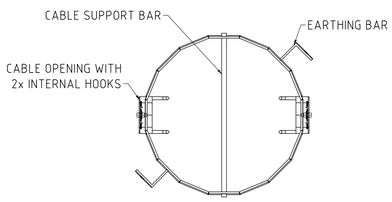
COMPONENT SCHEDULE



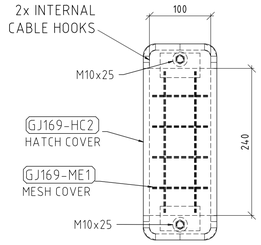
POLE ELEVATION (1:80)



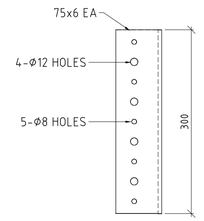
SECTION D-D (1:15)



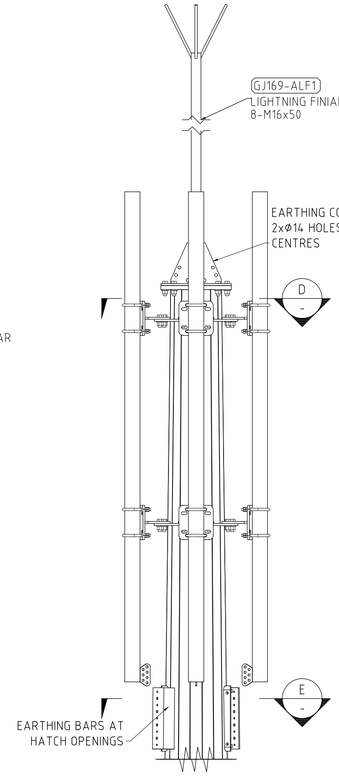
SECTION E-E (1:10)



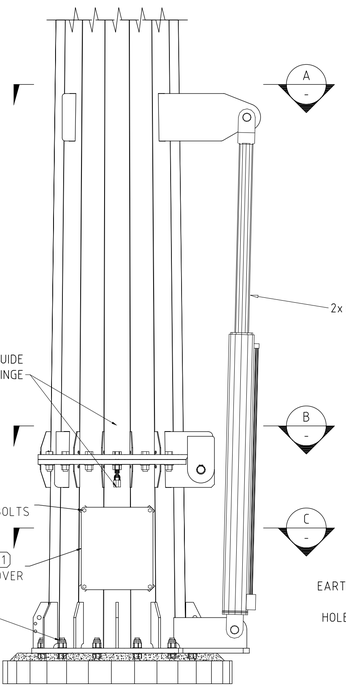
CABLE OPENING DETAIL (1:5)



EARTHING BAR DETAIL (1:5)



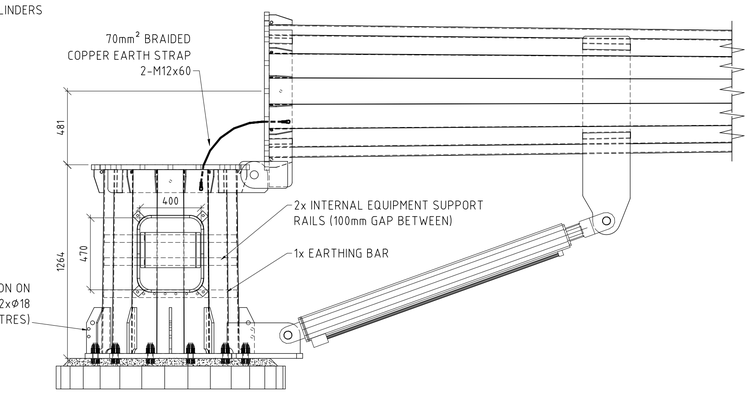
ANTENNA MOUNT ELEVATION (1:15)
ANTENNAS NOT SHOWN



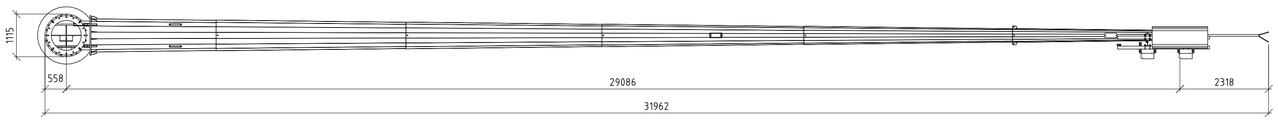
POLE BASE ELEVATION
RAISED (1:20)

NOTE:
REFER TO THE FOUNDATION DETAILED DRAWING FOR GROUT AND CONDUIT REQUIREMENTS

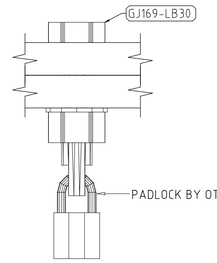
ANTENNA SUPPORT STRUCTURE DESIGNED IN ACCORDANCE WITH PTA220031 - AS4902 BOOK 4A, PTA220031 - AS4902 BOOK 4B AND PTA220031 - AS4902 BOOK 4C



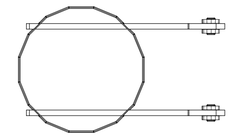
POLE BASE ELEVATION
LOWERED (1:20)



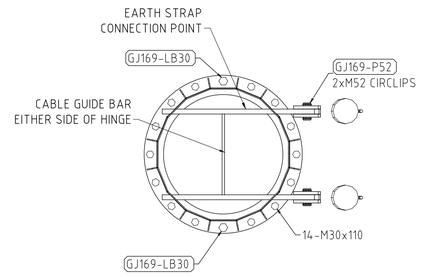
PLAN VIEW (LOWERED POSITION) (1:80)



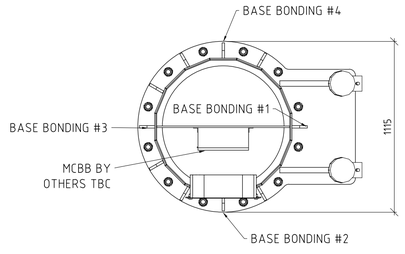
LB30 DETAIL (1:3)



SECTION A-A (1:20)



SECTION B-B (1:20)



SECTION C-C (1:20)

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
B	07.09.23	PRELIMINARY DESIGN	A.B	D.T	C.C	J.W
A	13.07.23	PRELIMINARY DESIGN	A.B	D.T	C.C	J.W

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

UGL ROAM ENGINEERING

Contractor No: GJ170-1-30 | Rev: F

REFERENCES

SCALE

DATUM
HORIZONTAL: PCG2020
VERTICAL: AHD71

DESIGNED	A.BERTOLI
DRAWN	D.TODD
CHECKED	C.COOPER
APPROVED	
DATE	

Government of Western Australia Public Transport Authority

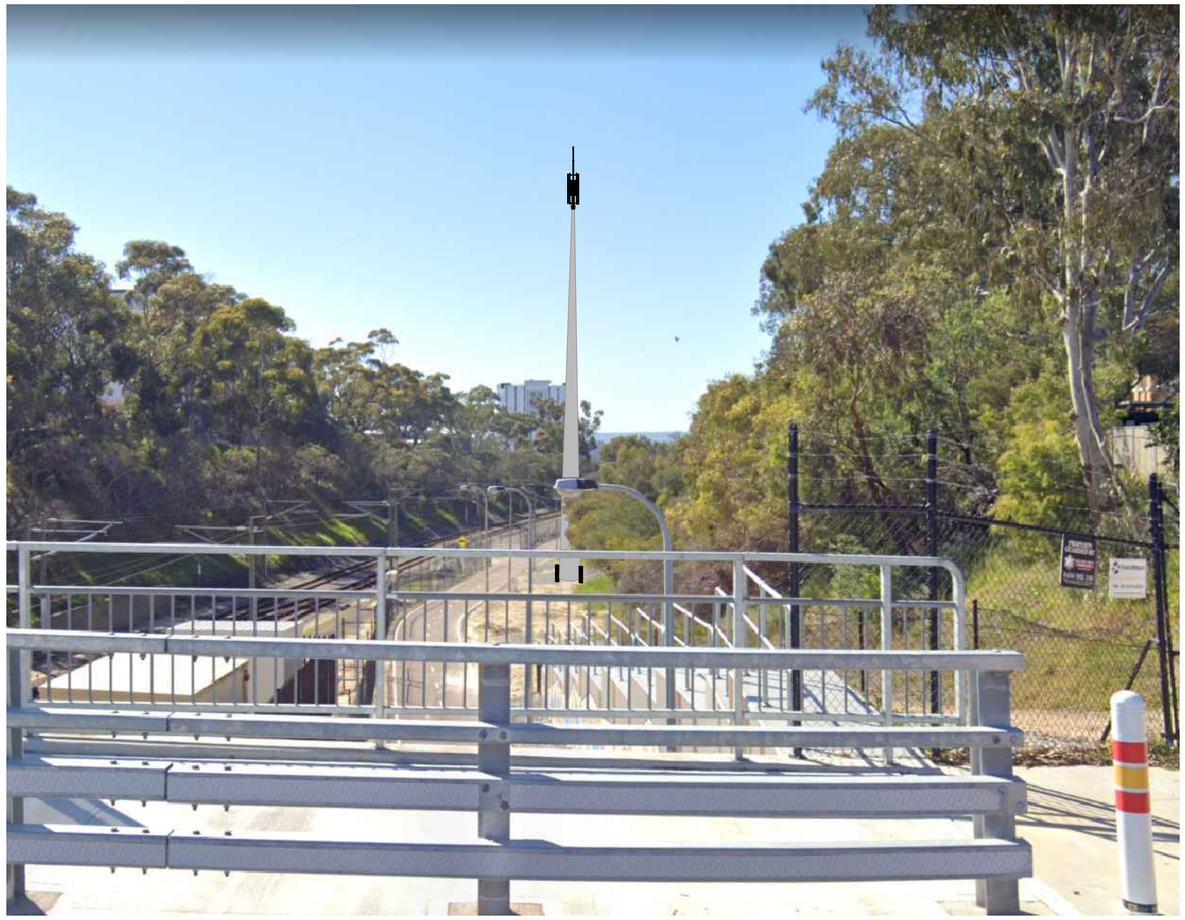
RADIO SYSTEM REPLACEMENT

TYPICAL DRAWING
MOBILE RADIO SYSTEM
30m HINGED MONOPOLE GENERAL ARRANGEMENT

PTA Drawing No: 00-T-04-0068 | Rev: B

CAD DRAWING PATHNAME Z:\RoamJobs\gj001100\GJ170\4_Drawings\MONOPOLES\GJ170-30m\Details\GA 30m-E.dwg

LOOKING SOUTHEAST



LOOKING EAST

NOTES:
1. 25M HINGED MONOPOLE TO BE INSTALLED WITHIN RAIL RESERVE
2. FOLD DIRECTION TO BE IN A EASTERLY DIRECTION (TOWARDS THE CITY)
3. SITE IS ON FLAT GROUND WITH SUFFICIENT SPACE FOR MONOPOLE.
4. EQUIPMENT TO BE INSTALLED WITHIN COMMUNICATION ROOM (PICTURED IN MONTAGE LOOKING EAST).

PRELIMINARY

REV	DATE	AMENDMENT	DSN	DRN	CHK	APP
D	24.03.23	PRELIMINARY DESIGN	AR	RJV	AM	NS
C	30.10.19	UPDATED TO PTA COMMENTS	AW	LM	AM	NS
B	06.09.19	UPDATED TO PTA COMMENTS	AW	LM	AM	NS
A	19.06.19	CONCEPT DESIGN	AW	LM	AM	NS

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

Contractor No: Rev:

REFERENCES

SCALE NTS

DATUM
HORIZONTAL: N/A
VERTICAL: N/A

DESIGNED A.RAJAH
DRAWN R.VARNAVIDES
CHECKED A.MANGANO
APPROVED
DATE

Government of Western Australia Public Transport Authority

RADIO SYSTEMS REPLACEMENT

WEST LEEDERVILLE
EUTRAN
SITE PLAN AND ELEVATIONS

PTA Drawing No: 13-T-04-0098 Rev: D

CAD DRAWING PATHNAME L:\03 - AutoCAD\New Standards - Nov 2019\PTA Drawing Sheets - General\PTA_A1_Sheet.dwg

APPENDIX C HIGH-CAPACITY SIGNALLING: RADIO SYSTEMS REPLACEMENT – METRONET FACT SHEET

GOVERNMENT OF WESTERN AUSTRALIA

METRONET

High Capacity Signalling: Radio Systems Replacement

We are investing in Perth's future transport needs by upgrading the rail network's radio system to be able to run more trains.

The Radio Systems Replacement project will replace the existing analogue system with a digital system, involving the installation of monopoles across the rail network.

The project will help to deliver High Capacity Signalling, which will provide increased reliability and flexibility of trains, to support a more efficient rail network for Perth's growing population.

Why is a new radio system needed?

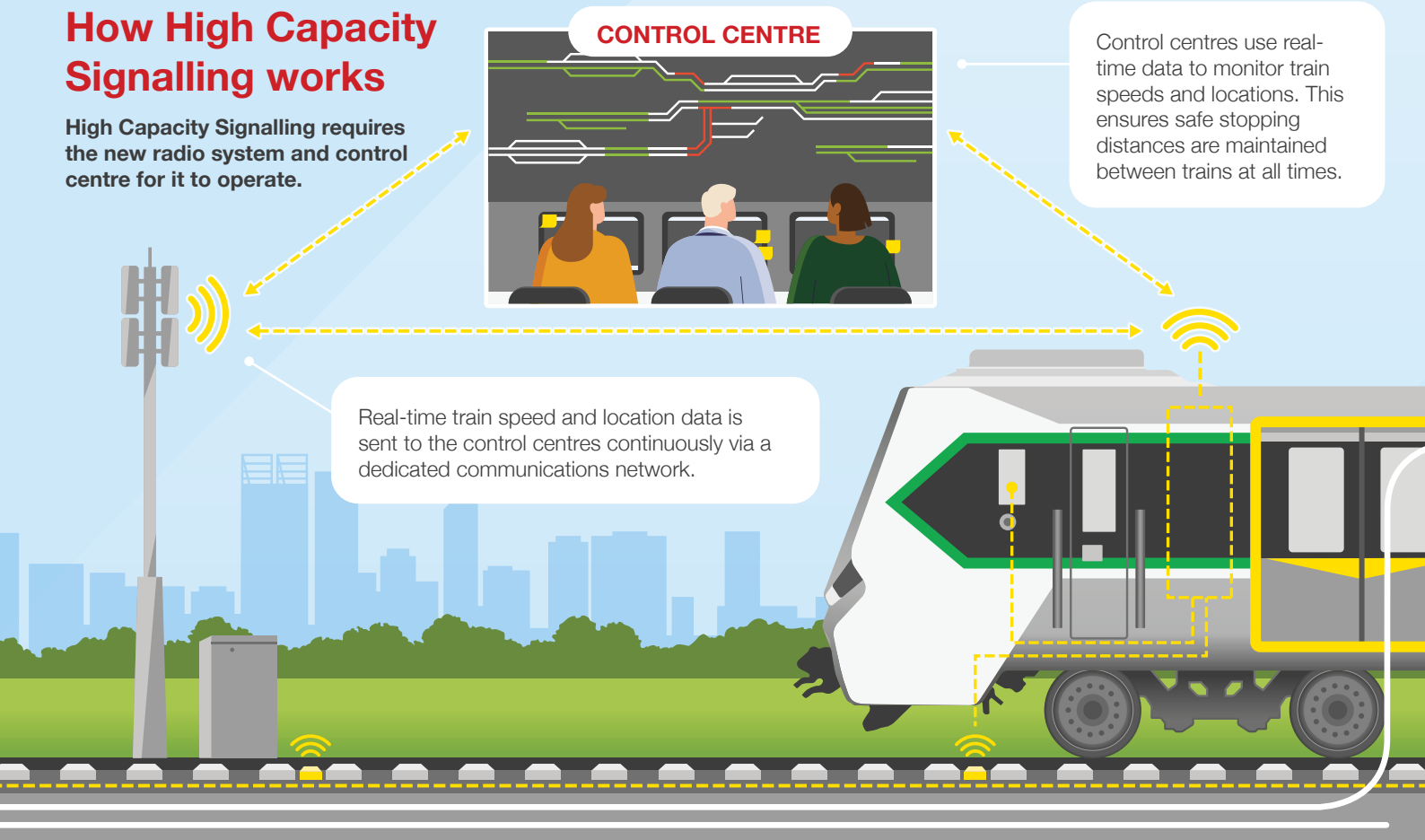
Radio communications are critical for coordination between train drivers and train control, and monitors the position and status of all trains and signals. Radio also provides the most reliable means of voice communication, since the use of other methods (e.g. mobile phones) can be affected by network congestion or limited coverage (especially when underground).

Replacing the existing radio system is required because:

- The current system, based on analogue technology developed in the 1990s, is approaching its end-of-life, with replacement parts becoming difficult to source.
- The Australian Communications and Media Authority has mandated that railway organisations across Australia vacate large parts of the radio spectrum commonly used by railways (the 400MHz band) to give priority to emergency services. The new digital system will use the 1800MHz band. Railway organisations in Sydney and Melbourne have already undertaken this process.

How High Capacity Signalling works

High Capacity Signalling requires the new radio system and control centre for it to operate.



Australian Government
BUILDING OUR FUTURE

Delivery agency: Public Transport Authority

April 2023

Construction

The new digital radio system will include the construction of around 120 radio masts known as 'monopoles' to be located across the rail network.

The monopoles will be made of steel, with antennas attached to the top. They will vary in height from 8-35m, with a base circumference of 50-100cm (depending on pole height). The monopoles will be located on state-controlled land, including within the rail reserve and freeway corridor, and at station car parks and railcar depots.

The installation of monopoles will then begin on the Midland Line in late-2023, followed by other lines on the network until the project is complete.

Construction at each monopole site will be staged throughout the project in four key stages.

Foundation construction (two to three weeks): excavation of site and pouring of concrete for monopole foundation.

Conduits and cables (one week): trenching, laying and installation of conduits and cabling.

Monopole construction (one week): assembly and erection of the monopole.

Fit out of radio equipment (one week): delivery and installation of equipment cabinets and fit out of antennas on monopoles.

Example of a monopole

Project timeline

- Geotechnical works and service location — EARLY-2023
- Design of monopoles — MID-2023
- Construction starts — LATE-2023
- Testing and commissioning — 2024
- New system introduced — 2025

MORE INFORMATION
9326 3666
metronet.wa.gov.au
info@metronet.wa.gov.au
@metronetperth

Delivery agency: Public Transport Authority

URBIS