SAPTA

Government of South Australia
Department for Infrastructure and Transport

Public Transport Standard Bus and Tram Passenger Information

SAPTA Asset Management

PI6-DOC-003515

DOCUMENT AMENDMENT RECORD

REV	CHANGE DESCRIPTION	DATE	COMMENTS
1	Initial Issue	April 23	1. New drawings created for PI Standard PI2-DRG-500069 PI2-DRG-500070 PI2-DRG-500072 PI2-DRG-500089 PI3-DRG-500090
Document Review Schedule:		3 yearly	

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1. Introduction

The South Australian Public Transport Authority (SAPTA) is a Directorate within the Department for Infrastructure and Transport (DIT) responsible for the delivery of public transport services.

SAPTA on behalf of The Department manages the Adelaide Metropolitan Public Transport Network. As part of the execution of responsibilities of this role it must have a governance structure which includes the adoption of standards, policies and procedures.

2. Purpose

The purpose of this Standard is to provide guideline requirements for design, supply, and installation of passenger information at bus interchanges, bus stops, tram stops, and Park 'n' Rides.

3. Scope

This Standard applies to The Department projects and contractor organisations designing, supplying, and installing passenger information (PI) for bus and tram. The Standard is applicable only to passenger information for bus and tram.

4. Related Documents

DOCUMENT NAME	DOCUMENT NUMBER
Communications Network Principles and Practices for Public Transport	PTS-AR-10-CN-SPE-00200400
Drafting requirements for SAPTA Drawings	AM5-DOC-003408
Guideline for Low Voltage Electrical Earthing and Bonding for the Adelaide Metro Tram Network	TP2-DOC-002020
Guidelines for the Protective Provisions Related to Electrical Earthing and Bonding for the Adelaide Metro Electrified Rail Network	AR-EL-STD-0102
SAPTA Wayfinding Rulebook V3.0 Rev E	
Adelaide Metro Bus Service Passenger Information System Real Time 'Totem' PI Displays Unmetered Mains Power Details	CE3–DRG–550719
Supply and Installation of Conduits and Pits	RD-EL-C3
Plastic Pits & Secure Steel Lids – Class A & B Surrounds	S-4055 Sheet 68
Standard Drawing – Tram System – Tram Stop VA / HIIL Unit – General Layout	PI2-DRG-500069
Standard Drawing – Tram System – Mount Over Beam Timetable Display – General Layout	PI2-DRG-500070
Standard Drawing – Tram System – Tram Beam Mount Timetable Display – General Layout	PI2-DRG-500072
Standard Drawing – Tram System – Tram Stop PI Timetable Display – General Layout	PI2-DRG-500089
Standard Drawing – Bus System – Bus Stop Active 'Totem' Display – General Layout	PI3-DRG-500090

5. References

- AS/CA S008 Requirements for Customer Cabling Products
- AS/CA S009 Installation Requirements for Customer Cabling (Wiring Rules)
- AS 1768 Lightning Protection
- AS 3008 Electrical installations – Selection of Cables - Cables for Alternating Voltages up to and Including 0.6/1 kV – Typical Australian Installation Conditions
- AS 3000 Electrical Installations (Wiring Rules)

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- AS 1428.1:2021 Design for access and mobility - General requirements for access - New building work
- AS1428.4.2018 Design for access and mobility - Means to assist the orientation of people with vision impairment - Wayfinding signs
- AS 1428.5:2021 Design for access and mobility - Communication for people who are deaf or hearing impaired
- AS 62368.1 Audio/video, information and communication technology equipment - Safety requirements (IEC 62368-1:2018 (ED. 3.0), MOD)
- AS 61000.6.1 Electromagnetic compatibility (EMC) - Generic standards - Immunity for residential, commercial and light-industrial environments.
- AS 60529 Degrees of protection provided by enclosures (IP Code)
- IEC 60268-16:2011 Sound system equipment – Part 16: Objective rating of speech intelligibility
- AS/NZS 1170.1 Structural design actions - Part 1: Permanent, imposed and other actions
- AS/NZS 1170.2 Structural design actions - Part 2: Wind actions
- AS 4100 Steel structures
- AS/NZS 1664 Aluminum structures
- AS360 Concrete structures
- AS1554 Structural steel welding
- AS1665 Welding of aluminum structures
- AS1110, AS1112 and AS1237 - ISO metric hexagon bolts and screws - Product grades A and B – Bolts; ISO metric hexagon nuts - Style 1 - Product grades A and B; Plain washers for metric bolts, screws and nuts for general plan
- AS1252 High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements

6. Supply, and Installation Requirements

6.1. General

The Bus and Tram PI System utilises a webpage-based solution created and maintained by The Department. The hardware is to consist of a free-standing passenger information display and enclosure referred to as a Totem unit for Bus and a shelter mount display and enclosure referred to as a Timetable Display (TTD) unit for Tram. Both hardware types are to be standardised with similar components in each.

The PI Totem/TTD units are to include the following:

6.1.1. LCD Panel

- Typical size of 32" for Bus and 38" at 1/2 height for Tram
- 2000NITs brightness
- Automatic brightness

6.1.2. Router

- Industrial/ruggedised
- Operate 4G/5G LTE
- Integrated VPN, firewall, NAT, and packet filtering

6.1.3. PC

- Min specification (8GB RAM, 60G SSD, Windows OS), 2x GbE LAN ports, 2x HDMI outputs, 2x analogue audio output ports, graphics to run dual 4K LCD panels
- Small form factor
- As part of supply, loaded with The Department supplied programming/scripts as per Section 10 Table 2.

6.1.4. Monitoring System

- Allows remote monitoring of environmental conditions inside the Totem/TTD and to monitor all active devices i.e., router, PC, display etc.
- Utilises SNMP v3

6.1.5. Ventilation and Cooling System

- Ensure inside temperature of Totem/TTD remains less than 70°C
- All electronic equipment supplied must be able to operate in temperature range -5°C to 70°C.

6.1.6. Enclosure

- IP65 as per AS60529
- Secured, but allow for easy access for technicians
- 9.5mm Anti Reflective (AR) Coated Polycarbonate protective cover for LCD Panel with:
  - Anti-graffiti coating; and
  - UV protective film
- All electronic equipment supplied must comply to safety requirements of AS62368.1 and EMC requirements of AS61000.6.1.
- Where steel products are used, material is to be as per AS1594, AS3679 and AS3678, with welding as per AS1554
- Where aluminium products are used, material is to be as per AS1664, with welding as per AS1665
- For specifications/dimensions refer 7.2 for Tram and 7.3 for Bus

6.1.7. Voice Annunciator (VA)

- On button press, the VA announces next bus/tram information
- Announcement method is via text-to-speech to read out loud what is displayed on the screen
- The VA for Bus is integrated with the Totem, and for Tram TTD is to be mounted/installed remotely
- The VA speaker is to have:
  - A minimum speech transmission index (STI) of 0.5 as per IEC 60268-16.
- Allow for electrical/communications connections to the Totem/TTD

6.1.8. Hearing Impaired Induction Loop (HIIL)

- Each VA is to have an associated HIIL. This comprises of a loop of cable and amplifier which creates a magnetic field which can be received by hearing aids (having a "T-switch" facility).
- The HIIL is to be triggered when the VA push button is pressed and is to announce the same information as the VA.
- The HIIL system is to include loop/coil and amplifier.
- The HIIL coverage requirements are to be as per AS1428.5

6.1.9. VA and HIIL Physical Specification

- For typical dimensions refer to PI2-DRG-500069
- Yellow button, illuminated, minimum width of 35mm
- Aluminium or steel construction for frame
  - Charcoal grey – powered paint
- Braille signage as per AS1428.4 reading "press for timetable information" or similar for button
- For decal/sticker refer to SAPTA Wayfinding Rulebook Section 4

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6.1.10. Design Life

Equipment design life shall be as per Table 1.

Table 1: Design Life

EQUIPMENT	YEARS
Router, PC	5
Display	5
HIIL	10
VA	10
Monitoring System	10

Submission of a proposed products list, including specifications constitutes a **Hold Point**

6.2. Tram

6.2.1. Display and Enclosure

Tram PI consists of a shelter mounted TTD with a typical size of 38" at 1/2 height LCD panel and a physically remote ground mount combined VA and HIIL unit.

Tram TTD Enclosure dimensions/specification:
- For typical dimensions refer to PI2-DRG-500089
- Dark grey – powdered paint

Submission of enclosure design, including equipment layout, communications and electrical wiring constitutes a **Hold Point.**

6.2.2. Position and Mounting

Tram PI TTD will utilise one of the mounting options below:
- Mount over Beam, refer to PI2-DRG-500070
- Tram Beam Mount, refer to PI2-DRG-500072

Tram PI TTDs are to be mounted to ensure on of the below, but not at 90° to platform:
- Visibility for passengers approaching the platform via entrance ramp
- Visibility for passengers waiting to board service

The TTDs shall be angled down at approximately 15° to horizontal to allow for optimal viewing.

The Tram PI TTD install position including height will comply to AS 1428.1:2021 and height to be factored into mounting load design for AS1170.1.

Install position for both TTD and combined VA and HIIL is to be as per below tram general arrangement drawings:
- CS2-DRG-365079 Standard Drawing - Tram Stop – Urban Platform Arrangements - General Layout
- CS2-DRG-365080 Standard Drawing - Tram Stop - Marginal Platform – Urban Standard Amenity Shelter - General Layout
- CS2-DRG-365082 Standard Drawing - Tram Stop - Island Platform – Urban Standard Amenity Shelter - General Layout

Tram PI TTD mounting requirements:
- Loading to be designed as per AS1170.1 and AS1170.2 and Building Code of Australia (BCA) Volume 1. An additional live load of 110kg is to be included in the design in case of vandalism.
- Steelwork to be as per AS4100, welding as per AS1554 and hot dip galvanised as per AS4680
- Steel material to be as per AS1594, AS3679 and AS3678
- Nuts, bolts and washers as per, AS1112, AS1111 and AS1237, hot dip galvanised as per AS4680.

Refer to Appendix 2 for a typical Tram PI layout.

Submission of mounting design constitutes a **Hold Point**.

6.2.3. VA and HIIL

Tram PI combined VA and HIIL is to be secured to stop shelter post with button facing parallel to track, with 1000mm clearance in front and parallel to allow disability access as per AS1428.1.

The combined VA and HIIL unit is to be connected back to the Tram PI TTD for both power and data.

The combined VA and HIIL unit is to have a reflective yellow sticker on its sides and top.

6.3. Bus

6.3.1. Display and Enclosure

Bus Passenger Information is constructed as a single Totem unit (made up as Screen and Enclosure), including VA and HIIL component.

Bus PI Totem dimensions/specification:
- For typical dimensions refer to PI3-DRG-500090
- Charcoal grey plinth – powdered paint
- Icons, text, and colours on the enclosure shall comply with SAPTA Wayfinding Rulebook, refer Appendix 1 for example.

Submission of enclosure design including equipment layout, communications and electrical wiring constitutes a **Hold Point.**

6.3.2. Position and Footing

Bus PI unit is to be installed to ensure one of the below:
- Parallel to road to provide visibility to passengers at stop
- Facing ramp to provide visibility to passengers approaching stop (only at interchanges)

Bus PI VA is to have a clearance of 1000mm in front and parallel to the unit to allow disability access, as per AS1428.1.

Bus PI footing requirements:
- Loading to be designed as per AS1170.1 and AS1170.2 and Building Code of Australia (BCA) Volume 1.
- Steelwork is to be as per AS4100, welding as per AS1554 and hot dip galvanised as per AS4680
- Steel material is to be as per AS1594, AS3679 and AS3678
- Concrete is to be as per AS3600

- Concrete reinforcing as per AS4671
- Bolts, nuts and washers as per AS1252 and hot dip galvanised as per AS1214 and AS4680 (washers)

Where conduits and pits are required, supply and installation shall be as per RD-EL-C3 and S-4055 Sheet 68.

Refer to Appendix 2 for a typical Bus PI layout.

Submission of footing design shall constitute a **Hold Point.**

6.4. Power Supply and Isolation

6.4.1. General

Totem surge protection and its associated earthing shall comply with AS 1768 Lightning Protection.

Where Totems/TTDs are installed at Tram Stops, there are additional requirements for earthing and bonding as per TP2-DOC-002020 Guideline for Low Voltage Electrical Earthing and Bonding for The Adelaide Metro Tram Network.

Where Totems/TTDs are installed at Train Stations, there are additional requirements for earthing and bonding as per AR-EL-STD-0102 Guidelines for The Protective Provisions Related to Electrical Earthing and Bonding for The Adelaide Metro Electrified Rail Network.

All electrical wiring is to be sized as per AS3008 and electrical installation of Totems/TTDs is to be as per AS3000 including earthing and bonding.

Earthing and Bonding design to suit stop constitutes a **Hold Point.**

6.4.2. Tram

Power feed for each Tram PI TTD will be supplied from a Tram switchboard RCD protected circuit. A lockable (C1003 key, Clipsal 56K2SW220) isolating switch is to be installed on shelter beam close to Tram PI TTD to allow for a technician to safely maintain the equipment without having to isolate at the switchboard. The switch will isolate both the TTD and combined VA and HIIL unit.

Where there are multiple TTDs, each shall be on a separate circuit, with their own individual isolating switch.

6.4.3. Standalone Totem/TTD

Where the Totem/TTD is installed as a stand-alone unit and power feed is from a switchboard that is not owned by The Department, it is to have one of the below:

- Isolation switch
- Submersible power enclosure as per CE3–DRG–550719

7. Public Address (PA) System

Consideration should be given for the provisioning of live messages delivered by operational personnel for extemporaneous or emergency messages for greenfield Tram stops or as specified by The Department.

8. Testing and Commissioning

The attached ITP (Appendix 3) shall be completed for Bus and Tram PI installs.

Site walkthrough shall be organised as part of the system acceptance process. This shall constitute a **Hold Point**.

9. Records and Documents

The below documents are to be supplied as part of Bus and Tram PI installs:
- As-built drawings on SAPTA template/title block as per AM5-DOC-003408 Drafting Requirements for SAPTA Drawings
- Shop drawings
- FAT and other commissioning documentation
- Manuals and warranty documentation

Submission of above documentation constitutes a **Hold Point**.

10. Connectivity and Configuration / Operation

The primary elements of the Totem/TTD consist of a PC and Router. The PC is hardcoded with a URL of the webpage displaying the timetable for the stop or interchange. Table 2 lists overall system configuration to be included by the vendor/supplier in the PC install. The current PC image can be requested from The Department. On power up, the PC will launch several scripts to start 'Kiosk' mode to display the webpage in full screen mode and run the 'KioskButton' application.

Table 2: Supplied Programs/Scripts by The Department

SCRIPT/PROGRAM	DESCRIPTION
KioskButton	Runs program that upon receiving trigger from pushbutton uses browser text-to-speech to read out webpage
Chrome-Kiosk	Runs Chrome in full-screen mode with URL of webpage showing timetable of stop/interchange
URL (Chrome)	Chrome configuration will run the correct URL page for the stop/interchange
Teamviewer	Allows restricted access remote control of Totem/TTD PC
Reboot	Script to automatically reboot the Totem/TTD PC at midnight
Shutdown (HASSIO)	Script to shutdown Totem/TTD remotely
TOTEM/TTD	**DESCRIPTION**
Workstation BIOS	Set BIOS to autostart on power-on
Operating system	Windows 10 or better

10.1. Network Connectivity

All Bus and Tram PI Totems/TTDs are connected to The Department PI WAN via a private APN.

The initiator must liaise with The Department for the supply of:
- Wireless SIM
- Assignment of WAN IP Addresses
- Router WAN configuration rules

11. Hold Points

Table 3: Hold Points

DOCUMENT REFERENCE	HOLD POINT	RESPONSE TIME (WORKING DAYS)
6.1	Submission of Proposed Products	5
6.2.1	Submission of Enclosure Design – Tram	10
6.2.2	Submission of Mounting Design – Tram	15
6.3.1	Submission of Enclosure Design – Bus	10
6.3.2	Submission of Footing Design – Bus	15
6.4.1	Submission of Earthing and Bonding Design	5
8	Site Walkthrough	10
9	Submission of As-builts, O&M and T&C Documentation	15

APPENDIX 1 SIGANGE DESIGNS PASSENGER INFORMATION BUS, TRAM

4.4.2 Stop / platform signage suite

Primary Node ID - Bus City Stop - Digital + Reskin Front

City bus stops are installed along major bus transit zones within inner city Adelaide. Used as a major bus stop identifier for commuters, including digital route information or static journey map and route information.

Primary Icon:
151mm Diameter

Stop Identification:
DIN Next LT Pro Bold: 510pt / 120mm
Suffix: DIN Next LT Pro Bold: 175pt / 44mm

Secondary Icon:
55mm Diameter

Tertiary Icon:
25mm Diameter

Secondary Text:
DIN Next LT Pro Medium: 110pt / 36mm
DIN Next LT Pro Light: 110pt / 36mm

Tertiary Text:
DIN Next LT Pro Regular: 75pt / 20mm
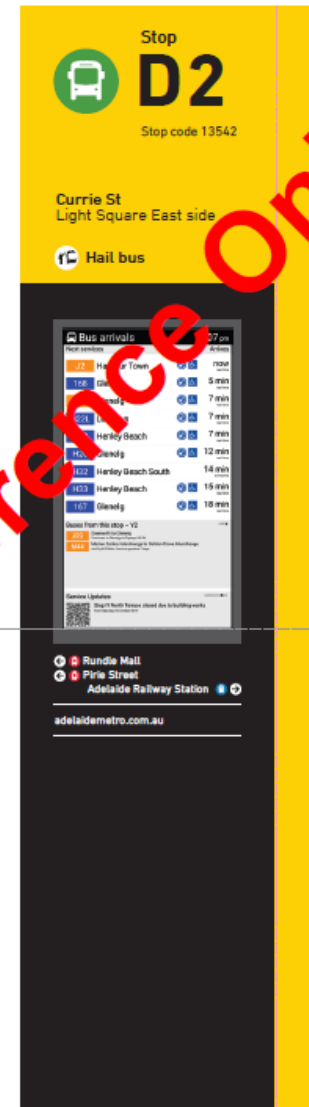
Stop Code:
DIN Next LT Pro Regular: 80pt / 26mm

Re-skin:
Relocate the primary icon, stop identification and stop code by 70mm vertically to allow for the cast top cap. Remaining information says consistent across new and re-skin.

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4.4.2 Stop / platform signage suite

AMid742

Secondary Node Identification - City Tram Platform

The structure, station title and Adelaide Metro logo application at city tram stops is the responsibility of the tram service provider.
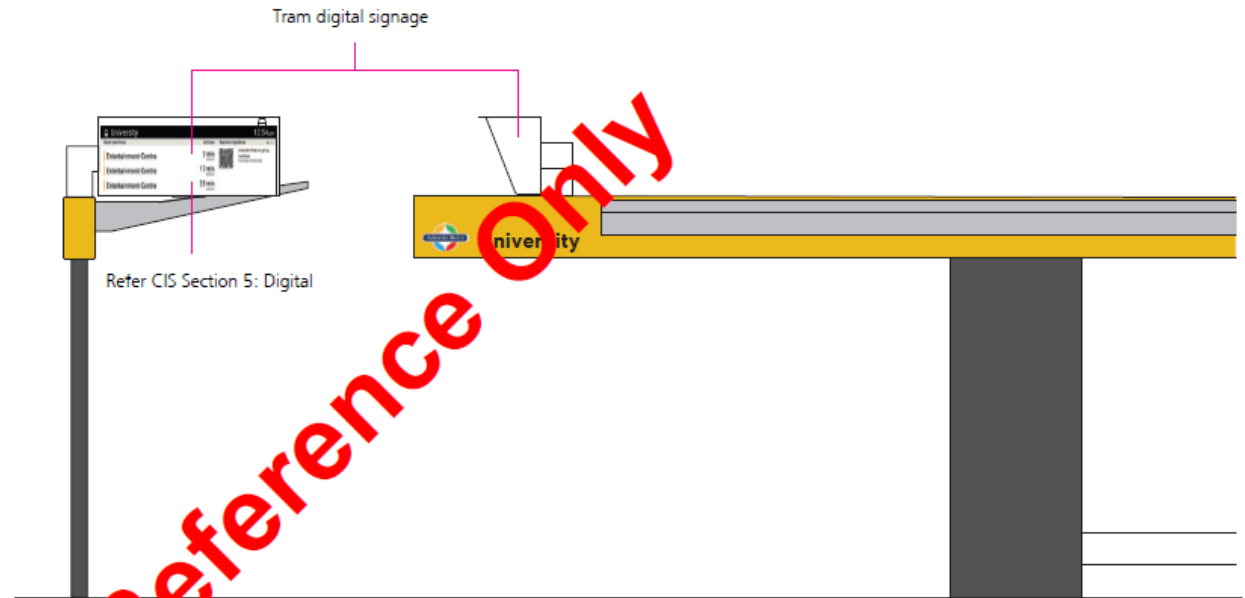
Service frequency signage and other customer information is the responsibility of Adelaide Metro Communications (refer Customer Information Standards, Section 10: Contacts).

Bus and Tram use the overarching public transport yellow, Train uses service colour, refer "Secondary Palette" on page 26.

Primary Icon:
170mm diameter

Primary Text:
DIN Next LT Pro Bold:

Tram digital signage

Refer CIS Section 5: Digital

1 (Icon)   1/2 (Icon)   1/3 (Icon)

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4.4.2 Stop / platform signage suite

AMid820

Facility Identification - Voice Announcers

Provide clear and concise information relating to security or other statutory information via icon and simple messaging.

Where possible, voice announcers are required to be installed at public transport stops. This is mandated in plinth stops that have electricity to them. Voice announcers have been installed at all digital plinth stops, as well as digital tram stops.

These announcers "read" the real time information as it is presented on the real time screen of the stop.
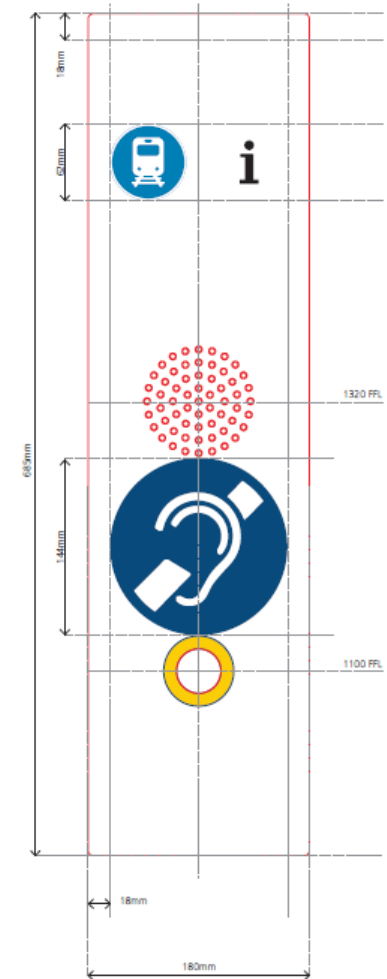
Trains operate with a different voice announcer system. See following page or contact SAPTA Rail Operations for details.

Primary Icon:
144mm Diameter

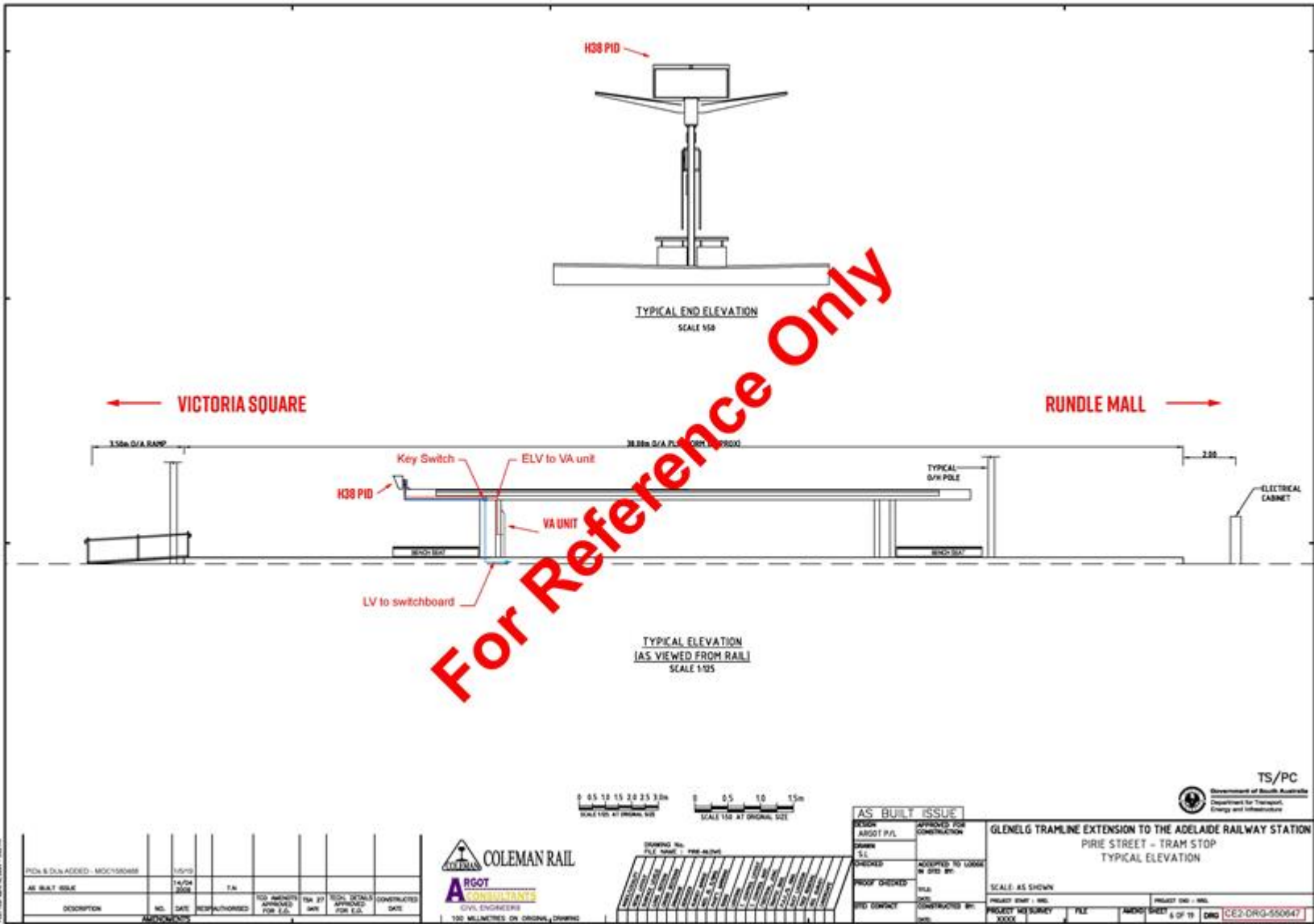**Secondary Icon:**
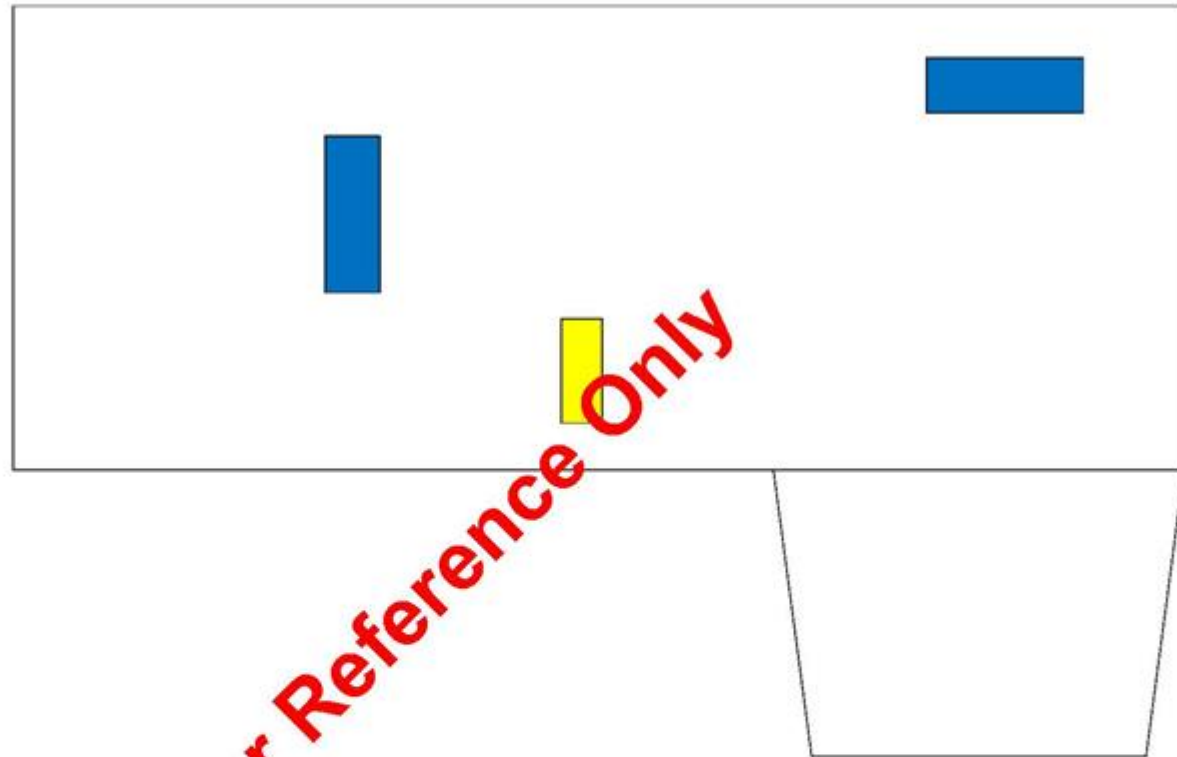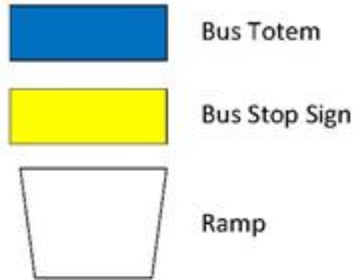62mm Diameter

Corner Treatment:
5mm Radius

18mm

62mm

1320 FFL

695mm

144mm

1100 FFL

18mm

180mm

1 (Icon)   1/2 (Icon)   1/3 (Icon)

APPENDIX 2 GENERAL ARRANGEMENTS INFORMATION BUS, TRAM

Bus Totem

Bus Stop Sign

Ramp

For Reference Only

REV. 0 | Drawing Not To Scale | 22/02/23 | BY BW

APPENDIX 3 ITP PASSENGER INFORMATION SYSTEM BUS, TRAM

LOCATION:		PROJECT:		DATE:	
Tester	Name:				
	Signature:				
	Date:				

DESCRIPTION: TOTEM						
Item 1	Spec. No and Title	Description	Procedure	Expected Result	Pass	Comment
1.1		Screen Operation	Inspection	1. The screen must display correct timetable for stop/interchange		
1.2		PC/Router	Inspection/Test	1. All programs as supplied by The Department are installed and functional, including remote access by authorised users 2. Router connects to PI WAN, firewall/access rules as per Department instruction		
1.3		Monitoring System	Inspection/Test	1. All active devices are connected to monitoring system and status available through PI WAN		

DESCRIPTION: VA AND HIIL						
Item 2	Spec. No and Title	Description	Procedure	Expected Result	Pass	Comment
2.1	AS 1428.1:2021	DDA Control Height	Measure the height of the button from finished platform/ground	The height should be 1100mm from finished platform/ground		
2.2		VA Operation	Press the VA button	1. The speaker volume is adequate and is clear and undistorted. 2. The speaker reads out what is displayed.		
2.3	AS 1428.5:2021	Loop Operation	1. 1.Press the VA button 2. 2.Use a Loop Tester to observe and listen to the loop operation	1. An announcement is produced 2. The magnetic field strength shall not be <-6dB between 1200 to 1700 height and 300 distance from VA frame 3. The sound is clear and undistorted		

DESCRIPTION: ELECTRICAL						
Item 3	Spec. No and Title	Description	Procedure	Expected Result	Pass	Comment
3.1		Lockable Isolation Switch	Switch on/off	When isolator is off Totem, VA and HIIL units are all off		
3.2		Switchboard Isolation (at Equipment Room or P3 Pit)	Switch on/off	When switchboard RCD is off Totem, VA and HIIL units are all off		
3.3		UPS Backed Supply	Switch on/off	When site mains supply is off Totem, VA and HIIL units remain on		

DESCRIPTION: CIVIL						
Item 4	Spec. No and Title	Description	Procedure	Expected Result	Pass	Comment
4.1		Totem, VA and HIIL install	Inspection	1. Base is flush with finished platform/ground 2. 200mm concrete surround 3. 1000mm clearance in front and parallel of Totem, VA and HIIL		
4.2		Pits	Inspection	200mm concrete surround installed around pit		