



Tram Stop – Platforms

Engineering Standard

Asset Management

CS2-DOC-003441

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1. Introduction

The primary function of platform infrastructure is to provide passengers with safe, efficient and equitable infrastructure at Adelaide Metropolitan Railway Network (AMPRN) tram stops.

2. Purpose

The purpose of this standard is to outline the fundamental requirements for the design, construction and maintenance of tram stop platforms.

This standard must be read in conjunction with The Rail Commissioner's tram stop standards, relevant tram system standards and The Department's Master Specifications.

3. Scope

This standard applies to all new and upgraded tram stop platforms.

Existing pedestrian access may be rated against this standard. In the context of this standard, 'rating' is the compliance review of pedestrian access that has been designed and installed prior to this standard being published.

4. Compliance

There are 3 types of provisions contained within this standard:

1. Requirements
2. Recommendations
3. Permissions

Requirements – it is mandatory to follow all requirements to claim full compliance with the standard. Requirements are identified within the text by the term '**must**'.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term '**should**'. Recommendations recognise that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term '**may**'.

Deviation from a mandatory requirement noted within this standard is only permitted when an Engineering Waiver has been provided to and approved Rail Asset Management.

5. Related documents

Table 1 – Related Documents

DOCUMENT NAME	DOCUMENT NUMBER
Standard Drawing - Tram System - Minimum Structure Outline - General Layout	CS2-DRG-365078
Standard Drawing - Tram Stop - Marginal Platform - Signage & Pavement Marking - General Layout	CS2-DRG-365081
Standard Drawing - Tram Stop - Island Platform - Signage & Pavement Marking - General Layout	CS2-DRG-365083
Standard Drawing - Tram Stop - Signage Schedule - Drawing Register	CS2-DRG-365085
Standard Drawing - Tram Stop – Platform Arrangements - General Layout	CS2-DRG-365079
Standard Drawing - Tram Stop - Marginal Platform – Urban Standard Amenity Shelter - General Layout	CS2-DRG-365080

Standard Drawing - Tram Stop - Island Platform – Urban Standard Amenity Shelter - General Layout	CS2-DRG-365082
Standard Drawing - Tram Stop - Marginal Platform – Closed Corridor Standard Amenity Shelter - General Layout	CS2-DRG-365274
Standard Drawing - Tram Stop - Island Platform – Closed Corridor Standard Amenity Shelter - General Layout	CS2-DRG-365275
Standard Drawing - Tram Stop - TGS1 & Pavement Marking - General Layout	CS2-DRG-365084
Standard Drawing - Tram Stop - Platform Clearances - General Layout	TP2-DRG-006978
Standard Platform Details – Installation and Footing Details for Platform Mirror Poles	735-A3-10-164
Pit and Conduiting Standard for Signalling and Communication Cables	PTS-MS-10-SG-STD-00000094
Public Transport Standard – Electrical Infrastructure	CS5-DOC-003511
Guidelines for Low Voltage Electrical Earthing and Bonding for the Adelaide Metro Tram Network.	TP2-DOC-002020
Track Geometry – Tram System Engineering Standard	TC1-DOC-003459
Standard - Tram Stop Overpasses – Tram Network	CS2-DOC-003442
Standard - Tram Stop Shelters - Tram System	CS2-DOC-003443
Standard - Tram Stop Station Signage and Pavement Marking	CS2-DOC-003445
Standard – Tram Stop Pedestrian Access – Tram System	CS2-DOC-003518
Public Transport Standard – Electrical Infrastructure	CS5-DOC-003511

6. References

The following referenced documents are used by this standard for information only:

- AS 1170 Structural Design Actions
- AS 1428 Design for Access and Mobility
- AS 2053.1 Conduits and fittings for electrical installation: General Requirements
- AS 2053.2 Conduits and fittings for electrical installations: Rigid plain conduits and fittings of insulating material
- AS 2700 Colour Standards for General Purpose
- AS 3000 Electrical Installations
- AS 3500.3 Plumbing and Drainage – Design Road Drainage
- AS 3600 Concrete Structures
- AS 3996 Access Covers and Grates
- AS 4586 Slip Resistance Classification of New Pedestrian Surface Materials
- AS 4663 Slip Resistance Measurement of Existing Pedestrian Surfaces
- AS 5100 Bridge Design
- HB 199:2014 Guide to the specification and testing of slip resistance of pedestrian surfaces
- AUSTROADS Guide to Traffic Management
- AUSTROADS Guide to Road Design
- DPTI Track and Civil Infrastructure Code of Practice

7. General

7.1. Design Life

The platform must have a design life of 50 years.

7.2. Platform Track Alignment

Track alignment through platforms must be straight without any vertical or horizontal curves.

For further detail, refer to TC1-DOC-003459 Track Geometry – Tram System Engineering Standard.

7.3. Platform Types

There are four types of platform configurations currently in use on the Adelaide Metropolitan Passenger Rail Network:

1. Marginal Platform – Single Track
2. Marginal Platform – Dual Track
3. Island Platform – Single Side Loading Only
4. Island Platform – Dual track

8. Dimensions

8.1. Platform Lengths

Platforms must be a minimum of 45m long (excluding ramps and access points) and designed so as not to preclude future extensions to 70m long.

8.2. Platform Widths

The table below nominates the minimum total platform widths that must be achieved and must achieve DSAPT requirements.

All efforts should be made to increase these minimum widths.

Table 2 – Platform widths

TRAM PLATFORM TYPE	LOCATION	MINIMUM TOTAL WIDTH (MM)
Marginal	At Grade – Ballasted Corridor ¹ and At Grade – Shared Corridor ²	3100
Island		4200
Marginal	Grade Separated ³	4800
Island		6500

Notes:

1. Where there is generally tram corridor fencing (e.g., Brighton Stop to South Terrace Stop)
2. Where there is generally no tram corridor fencing (e.g., City South Stop to Botanic Gardens Stop, Festival Plaza Stop and Entertainment Centre Stop)
3. Where the tram stop is either above or below natural ground level (e.g., South Road Stop)

Platforms must consist of four zones:

1. Loading Zone

A 300 mm strip where people board / alight the tram.

This zone includes the 100 mm wide yellow line.

2. Tactile Ground Surface Indicator (TGSI) Zone

A 300 mm strip which provides blind or vision-impaired customers with warning information.

3. Clear Circulation Zone (primary access path)

A minimum of either 1200mm or 1800mm (dependent on tram stop configuration) wide area free of obstructions which provides customers with an uninterrupted path of travel and access to station facilities area must be provided.

This zone includes the 100mm 'stand behind' white line.

4. Physical Structure Zone

This zone provides space for the installation of the tram stop shelter, furniture and poles for lighting, security system and passenger information system infrastructure.

Seats located in the Physical Structure Zone must be a minimum of 500mm away from the Clear Circulation Zone where possible.

8.3. Platform Height

The platform height adjacent the track must be 285mm, measured from the top of the nearest rail to the top of the platform edge.

For further detail, refer to TP2-DRG-006978 Standard Drawing - Tram Stop - Platform Clearances - General Layout.

8.4. Platform Offset

8.4.1. Allowance for AMPRN Track

The platform edge offset from the running edge of the nearest adjacent rail must be 545mm, measured from the running face of the nearest rail to the platform edge.

For further detail, refer to TP2-DRG-006978 Standard Drawing - Tram Stop - Platform Clearances - General Layout

8.4.2. Construction Tolerances

The tolerances of the edge of the platform alignment must be in accordance with Table 1 and verified in accordance with Master Specification Part PC-SI1 Site Surveys.

Table 3 - Construction Tolerances

PLANE	DESCRIPTION	TOLERANCES
Vertical	distance measured from top of rail to top of platform edge	+0/-5 mm
Horizontal	distance measured from vertical face of platform to gauge face of near side rail, where a negative value means an increase in the clearance dimension	+0/-5 mm

8.5. Vertical Head Clearances

Vertical head clearances on the platform must be in accordance:

- CS2-DOC-003443 Standard - Tram Stop Shelters - Tram System
- CS2-DOC-003442 Standard - Tram Stop Overpasses – Tram Network
- CS2-DOC-003445 Standard - Tram Stop Station Signage and Pavement Marking Tram System
- AS 1428.2 – Design for access and mobility

8.6. Allowance for Wide Bodied Trams

The platform design must include provision to allow for future wide-bodied trams (2650mm wide).

9. Design Requirements

9.1. Platform

The platform surface must be either a concrete slab or a paver slab (laid on a concrete slab).

- It is preferred that the concrete slab platform be cast in-situ. If precast elements are approved for use, then any cavities where lifting lugs are located must not be positioned so that the resulting patch is located on the surface of the platform.
- A paver slab must provide a smooth and continuous surface with mortar joints.

The platform slab must comply with all relevant Parts of the DIT Master Specification Structures.

The platform slab must be designed to withstand C5 crowd loading, and concentrated actions of up to 13kN to allow for category F maintenance vehicles in accordance with AS 1170.1.

Obstacles that abut an access path must have a luminance contrast with a background of not less than 30%.

9.2. Drainage

9.2.1. General

All platforms must be designed so that no water ponds on the platform.

Where platform drainage includes grates, these must be securely fixed with tamper proof fixings. If gratings are located within a walking surface, they must comply with slip resistance R10/R11 in accordance with HB 198:2014, as well as general requirements of AS 1428.2 Clause 9 (c) and AS 3996.

9.2.2. Marginal Platforms

Marginal platforms must drain towards the back of the platform away from the tracks. The storm water must drain:

1. into a drainage system at the rear of the platform, in the form of a strip drain for the full length of the platform; or
2. over/through the rear platform edge onto a suitably designed landscape area, or
3. over/through the rear platform edge into existing stormwater drainage system, where sufficient capacity is available and approved by the asset owner.

9.2.3. Island Platforms

Island platforms must drain towards the middle of the platform where water is collected in a strip drain for the full length of the platform and discharged into a drainage system.

9.3. Platform Surface

For further detail refer to CS2-DOC-003518 - Standard – Tram Stop Pedestrian Access – Tram System.

9.3.1. Fall

The platform must:

1. be graded so that the cross fall is away from tracks and be graded between a minimum grade of 1:100 and a maximum grade of 1:40 (measured from the back of the TGSI zone); and
2. have longitudinal fall that matches the adjacent AMPRN track grade, with minimum longitudinal fall of 1:200 for drainage and maximum longitudinal fall 1:100.

9.3.2. Concrete Surfaces

The colour of concrete slab surfaces must be grey within the following colour range in accordance with AS 2700:

- a) lightest tone – Dark Grey (N64); and
- b) darkest tone – Graphite Grey (N65).

Concrete slabs must provide a broomed finish in the same direction as the crossfall (perpendicular to track).

9.3.3. Granite/Bluestone Pavers

The colour of the paver surfaces must be charcoal grey.
Mortar joints must be provided between pavers.

9.3.4. Slip Resistance

All paving surfaces and surface elements must be slip resistant including; non-slip when wet or dry and paving surface materials must be wet rated at least R11 resistance as defined in Table 5 of AS 4586.

9.4. Platform Coping

The platform coping (generally the front 300mm of the platform edge) can be made up of a pre-cast or cast in-situ concrete block or a granite/bluestone coping stone.

9.5. Tactile Ground Surface Indicators

TGSIs must provide at least a 30% luminance contrast against adjacent surfaces.
TGSIs must be provided in accordance with CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System.

9.6. Lighting

All lighting on platforms must be provided in accordance with CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

9.7. Service Pits and Conduiting

The number of service pits on the platform must be minimised to prevent trip hazards.
Service Pits and Conduiting must be in accordance with PTS-MS-10-SG-STD-00000094 Pit and Conduit Standard for Signalling and Communication Cables and CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

Pits must:

1. be flush with the platform level;
2. not be placed within the clear zone, ramps or access paths; and
3. not be located under platform furniture.

Pit lids must provide adequate slip resistance to categories “R10” or “R11” in accordance with Table 5 of AS 4586. This must be read in conjunction with HB 197: *An introductory guide to the slip resistance of pedestrian surface materials*.

All pit lids must be securely fixed with tamper proof fixings. If pit lids are located in a walking surface they must comply with AS 1428.2 Clause 9 (c) and AS 3996.

9.8. Earthing and Bonding

Earthing and Bonding to be in accordance with TP2-DOC-002020 Guidelines for Low Voltage Electrical Earthing and Bonding for the Adelaide Metro Tram Network.

9.9. Platform Access

9.9.1. Public

Platforms must include ramped access to all platform entrances (excluding grade separated tram stop), in accordance with DSAPT.

Pedestrian access to platforms must be provided through a minimum of one primary access path per platform.

The design of the platforms must not preclude a future secondary access path.

The platform must be accessible by either stairs, lifts, ramps or direct access (generally platforms integrated and at grade). Refer to CS2-DOC-003442 Standard - Tram Stop Overpasses - Tram Network and CS1-DOC-002336 Lifts for Public Transport Infrastructure – Engineering Specification for information on stairs, lifts and ramps. Refer to CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System for all general access.

9.9.2. Vehicles

Public vehicular access to the platforms is prohibited.

9.10. Fencing/Balustrade

Fencing/balustrade must be provided where pedestrian access is not intended, i.e. the back and ends of the platform.

9.11. Handrails

Handrails must be provided on both sides of ramps, landing and steps. They must comply with AS 1428.1.

Kerb rails must be provided directly below handrails as required.

Where there is a fence is provided on a platform, handrails must be provided along the full length of trafficable areas (except at the platform ends) to assist in passive guidance without encroaching on general circulation along a platform in accordance with DSAPT (2002).

9.12. Tram Driver's Platform Sighting Mirrors

Tram Operations must advise if a mirror is required at a tram stop.

All mirrors must be installed in accordance with Drawing No. 735-A3-10-164 *Standard Platform Details – Installation & Footing Details for Platform Mirror Poles*.

All mirrors must be heated in accordance with CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

9.13. Water Point

To facilitate cleaning, a minimum of one metered water point must be provided at each tram stop. Water points must preferably be located on the platform in an access box as close as practicable to the shelter structure.

The water point must:

1. be located outside the access path, in a vandal resistant access box which must be locked with an "M" Padlock; and
2. be installed in accordance with TP2-DOC-002020 Guidelines for Low Voltage Electrical Earthing and Bonding for the Adelaide Metro Tram Network.

In addition, if the water point is set in the platform surface, the water point must:

1. have the padlock recessed and covered by a flush fitting spring loaded cover plate; and
2. be positioned so that the top of the access box is flush with the platform.

The access box must be large enough to allow easy operation of the tap, and easy cleaning and maintenance.

9.14. Vending Machines

Vending machines may be provided on platforms where compliance to DSAPT and CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

9.15. Ticketing Machines

Ticketing machines may be provided on platforms where compliance to DSAPT and CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

10. Materials and Finishes

Materials and finishes on the following components of the platform must be in accordance with the table below.

Table 4 - Materials and Finishes

ELEMENT	MATERIAL	FINISH	NOTES
Drainage pipes within the platform	Minimum of HDPE	N/A	PVC allowed on the condition that pipes are not damaged in construction and CCTV inspection is undertaken after construction to ensure no damage to the pipes
Drainage grates on the platform	Stainless Steel or galvanized iron	N/A	Non-slip R10/R11 in accordance with HB 198:2014.
Platform surface	Concrete/Bluestone paver	Concrete - Class 2 finish with a textured broom finish (same direction as crossfall) Granite/Bluestone paver – exfoliated	Non-slip R10/R11 in accordance with HB 198:2014. Further details see CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System
Platform coping	Concrete/Granite/Bluestone		
Tactile Ground Surface Indicator (TGSi)	Concrete/Granite/Ceramic	As per AS1428	Must provide a minimum 30% luminance contrast against adjacent surfaces
Fencing/ balustrade/ handrail	Stainless steel	Brushed	