



# Tram Stop – Overpass (Pedestrian and Shared Use Path)

## Engineering Standard

Asset Management

CS2-DOC-003442

## DOCUMENT AMENDMENT RECORD

REV	CHANGE DESCRIPTION	DATE	COMMENTS
1	Initial Issue	05/06/2023	
<b>Document Review Schedule:</b>		3 Yearly	

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## 1. Introduction

The primary function of tram overpasses is to provide passengers with safe, efficient and equitable access 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 overpasses.

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 Department overpasses at tram stops.

Existing overpasses 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 by Rail Asset Management.

## 5. Related Documents

Table 1 – Related Documents

DOCUMENT NAME	DOCUMENT NUMBER
Standard Drawing - Tram Overpass - Signage - General Layout	CS2-DRG-365086
Standard Drawing - Tram Stop - Signage Schedule - Drawing Register	CS2-DRG-365085
Standard Drawing - Tram Stop - Platform Arrangements - General Layout	CS2-DRG-365079
Pit and Conduit Standard for Signalling and Communication Cables	PTS-MS-10-SG-STD-0000094
Signal Sighting	PTS-MS-10-SG-STD-0000033
Lifts for Public Transport Infrastructure – Engineering Specification.	CS1-DOC-002336
Guidelines for Low Voltage Electrical Earthing and Bonding for the Adelaide Metro Tram Network.	TP2-DOC-002020

Standard – Tram Stop Pedestrian Access – Tram System	CS2-DOC-003518
Standard - Tram Stop Shelters – Tram System	CS2-DOC-003443
Public Transport Standard – Electrical Infrastructure	CS5-DOC-003511
Lifts for Public Transport Infrastructure – Engineering Specification	CS1-DOC-002336
Public Transport Infrastructure Security Systems Engineering Specification	PI5-DOC-003517
Design – Trams & Buses – Passenger Information Systems for Trams and Buses	PI6-DOC-003515

## 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 1735 Lifts, Escalators and Moving Walks
- AS 2700 Colour Standards for General Purposes
- AS 4534 Zinc and zinc/aluminum-alloy coatings on steel wire
- AS 4586 Slip Resistance Classification of New Pedestrian Surface Materials
- AS 4799 Installation of Underground Utility Services and Pipelines within Railway Boundaries
- AS 5100 Bridge Design
- BCA/NCC Building Code of Australia/ National Construction Code
- CP-TS-975 – Structural Clearances
- CP-TS-957 DPTI Code of Practice – Volume two – Train System [CP2] Part 7 – Structures
- CP-TS-962 DPTI Code of Practice – Volume two – Train System [CP2] Part 12 – Guard/Check Rails, Buffer Stops and Derails
- DPTI Design Standard: Structural
- AUSTROADS Guide to Traffic Management
- AUSTROADS Guide to Road Design
- D-2402 Traction Overhead Electrical and Mechanical Clearance
- *Disability Standards for Accessible Public Transport (DSAPT)*

## 7. Definitions

Table 2 – Definitions

TERM	DEFINITION
Overpass	A bridge over the tram corridor intended for use by pedestrians only, which provides access to a tram stop and/or to cross the tram corridor.
Shared Use Overpass	A bridge over the tram corridor intended for use by pedestrians and cyclists and pedestrians, which provides access to a tram stop and/or to cross the tram corridor.
Overpass Structure	The overpass, including any stairs, lifts or ramps that lead to the overpass.

## 8. Design Requirements

Access to and from an overpass at a tram stop must be via the provision of stairs and a ramp. Additional lift access may be provided.

This standard must be used as a guide for overpasses away from tram stops. Lifts must not be provided at overpasses away from tram stops.

New overpass and existing overpass structures being redesigned or upgraded must be designed to meet the requirements of Disability Standards for Accessible Public Transport (DSAPT), AS 1428 and The Department’s Design Standard: Structural. The overpass structure must comply with sight line requirements and must not obstruct signal sighting, in accordance with PTS-MS-10-SG-STD-00000033 Signal Sighting.

The overpass must be designed such that each end of the overpass is visible from the other end of the overpass.

Any ramps must be provided in accordance with CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System.

Shelter components of the overpass structure must be designed in accordance with the requirements of CS2-DOC-003443 Standard - Tram Stop Shelters – Tram System.

Tram stop overpass structures must not be designed for use by vehicles. Overpasses must be designed for pedestrian use. On an overpass that is only accessible by stairs, ramps or lifts, cyclists are required to dismount and walk their bike across the overpass. This is indicated by cyclist dismount signage on ramps leading to the overpass. Overpasses must have handrails and kerb rails provided in accordance with AS 1428.1.

Overpasses that do not require lift, stair or ramp access from the road level may be treated as a shared use overpass with approval from The Rail Commissioner, provided the path is wide enough to comply with the requirements of Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling. If the shared use overpass is at a level gradient, then hand and kerb rails are not required.

### 8.1. Design Life

The design life of an overpass structure must be 100 years, in accordance with AS 5100. The overpass platform must be a design life of 50 years.

## 8.2. Structural Dimensions

### 8.2.1. Span

The overpass structural span must allow for the operation of Rolling Stock and must not protrude/extend into any clearance envelopes.

### 8.2.2. Width

The minimum clear width between handrails of the overpass must be 1800 mm in accordance with AS 1428.2.

For an overpass that incorporates lifts the minimum clear width between handrails must be 3000 mm, to accommodate lift landing circulation space requirements in accordance with CS1-DOC-002336 Lifts for Public Transport Infrastructure – Engineering Specification.

### 8.2.3. Internal Height

The minimum clear internal vertical ceiling height of the overpass to the underside of any light fittings, CCTV cameras or other equipment must be 2500 mm.

### 8.2.4. Clearances

Clearances must comply with the relevant standards.

- CP-TS-975 – Structural Clearances
- TP2-DOC-003519 Standard – Overhead Wiring System Requirements for the 600v DC Tram Network – Tram System

## 8.3. Additional Structural Support Piers in the Railway Corridor

Intermediate support piers are not permitted within the railway corridor.

## 8.4. Earthquake Protection

Overpasses must be designed for BEDC-1 in accordance with AS 5100.2. The forces given in Clause 9 (of AS 5100.2) may be omitted.

Overpass structures must be designed to minimise the risk of collapse during earthquakes with consideration given to the following:

1. bearing arrangements;
2. widths of bearing shelves;
3. lateral and uplift restraints; and
4. reinforcing steel in columns.

### 8.5. Material Selection

The overpass structure must be unpainted hot dip galvanised steel or prestressed concrete.

The roof cladding must be in accordance with CS2-DOC-003443 Standard - Tram Stop Shelters – Tram System.

The side cladding must be steel welded mesh with 35% solidity, class W10Z10A in accordance with AS 4534.

All metal finishes must have no sharp edges, be de-burred, smooth and must provide a minimum radius of 3mm. Use of potentially reflective materials in areas that could cause glare for tram drivers must be avoided.

### 8.6. Waterproofing

The overpass surface must be waterproofed to prevent water seeping through joints.

### 8.7. Vandal Resistance and Anti-graffiti Coating

All overpass surfaces (excluding trafficable areas) must have anti-graffiti coating and this must provide resistance to discolouration due to age, spill, gum, food, graffiti etc. and allow for ease of cleaning. The coating must not compromise DSAPT luminance contrast and non-slip requirements.

### 8.8. Screens/ Solid Barriers

Overpass and stairs should be fully enclosed with use of roof and side cladding. The Rail Commissioner is required to endorse a non-enclosed overpass. The under stairs area must be fully enclosed from ground level.

To comply with AS 5100 clearances and to prevent objects being dropped or liquids being poured from the structure, a screen or solid barrier must be provided to protect the 600V DC trolley wire assembly (catenary). The screen material and design must be selected in consultation with The Rail Commissioner and must consider the structural integrity of the overpass/stairs.

### 8.9. Surfaces

Surfaces for all overpasses, stairs, lifts and pedestrian areas (e.g. waiting areas) must be provided in accordance with CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System.

### 8.10. Drainage

Overpass drainage must not be allowed to drain onto the track.

### 8.11. Vermin Proofing

Appropriate measures must be taken to prevent vermin infestation. The design of the overpass structure must prevent opportunities for winged species to nest or roost.

### 8.12. Utility Services

#### 8.12.1. Above Ground

The overpass structure must allow for all communications, power, CCTV, and any other services that are required to cross the rail corridor.



Services attachment must have a 100 year design life and must be designed for replacement with minimal delay to tram services.

Services, conduits and junctions must be concealed from view.

#### **8.12.2. Under Ground**

Alteration, relocation, lowering or replacement of existing underground services must be designed in accordance with PTS-MS-10-SG-STD-0000094 Pit and Conduit Standard for Signalling and Communication Cables and AS 4799.

#### **8.13. Earthing and Bonding**

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

#### **8.14. Lighting**

Lighting for overpasses, stairs, lifts and pedestrian areas must be provided in accordance with CS5-DOC-003511 Public Transport Standard – Electrical Infrastructure.

#### **8.15. CCTV**

CCTV coverage of overpasses, stairs, lifts and pedestrian areas is to be provided as part of the overall tram stop CCTV design. CCTV must be provided in accordance with PI5-DOC-003517 Public Transport Infrastructure Security Systems Engineering Specification.

#### **8.16. Public Address System**

A public address system must be provided in accordance with PI6-DOC-003515 - Design – Trams & Buses – Passenger Information Systems for Trams and Buses.

#### **8.17. Signage and Pavement Marking**

Signage and Pavement Marking must be provided in accordance with CS2-DOC-003445 Standard - Tram Stop Station Signage and Pavement Marking.

#### **8.18. Tactile Ground Surface Indicators**

TGSIs must be provided in accordance with CS2-DOC-003518 Standard – Tram Stop Pedestrian Access – Tram System.

#### **8.19. Advertising Hoardings**

Advertising signs and other hoardings must not be placed on the overpass structure.

### **9. Stairs**

#### **9.1. General**

Stairs must be provided in accordance with DSAPT, AS 1428.1 and AS 1657.

Stairs leading directly onto platforms must not have a wheel channel for bicycles. Refer to CS2-DOC-003448 Standard - Tram Stop Bicycle Facilities.

Stairs must have opaque (in-filled) risers, open risers are not permitted.

#### **9.2. Positioning of Stairs**

Where the lift car door opening is directly opposite the stair/ramp exit, a minimum horizontal width of 3000 mm must be provided between the two access points.

### 9.3. Structural Dimensions

#### 9.3.1. Width

The minimum clear width between handrails of the stairs and ramps must be 1800 mm in accordance with AS 1428.2.

#### 9.3.2. Height

The minimum clear internal vertical ceiling height of the stairs to the underside of any light fittings, CCTV cameras or other equipment must be 2500 mm.

### 9.4. Stair Nosings

Stair nosings must be installed on all stairs in accordance with DSAPT requirements. Adhesive stair nosings must not be used. Stair nosings not to introduce ponding.

### 9.5. Handrails

Handrails must be provided along both sides of the stairs in accordance with AS 1428.1, AS 1428.2 and DSAPT requirements.

## 10. Lifts

Lifts must be in accordance with CS1-DOC-002336 Lifts for Public Transport Infrastructure – Engineering Specification.