TRACK AND CIVIL INFRASTRUCTURE

CODE OF PRACTICE

VOLUME THREE - TRAM SYSTEM [CP3]

ACCESS CONTROL AND PROTECTION

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

The purpose of this part is to set standards to ensure:

a) that infrastructure used by the public to gain access to TransAdelaide property is safe and fit for purpose;

b) adequate security against unauthorised entry into TransAdelaide property;

c) safe access to infrastructure for TransAdelaide workers.

1.2 PRINCIPLES

This part complies with the principles set out in the "Code of Practice for the Defined Interstate Rail Network", volume 4, part 2, section 12.

1.3 SCOPE

This part specifies general procedures for the design and rating of, inspection and maintenance of the following:

a) fences and gates;

b) pathways, ramps, stairs, handrails;

c) pedestrian crossings;

d) level crossings;

e) commuter car parks;

f) passenger platforms;

g) subways and footbridges;

h) roadways in the right of way including vehicle, plant and other equipment access;

i) landscaping in the right of way.

1.4 REFERENCES

1.4.1 Statutory documents

Disability Discrimination Act (DDA) 1992

1.4.2 Australian Standards

AS 1428.1 - Design for access and mobility - Part 1: General requirements for access – new building work

AS 1428.2 – Design for access and mobility – Part 2: Enhanced and additional requirements – buildings and facilities

AS 1742.7 - Manual of uniform traffic control devices – Part 7: Railway crossings

AS 2890.1 - Parking facilities - Off street car parking

1.4.3 Industry codes of practice

The Building Code of Australia, Volume One

Code of Practice for the Defined Interstate Rail Network, volume 4 (Track, Civil and Electrical Infrastructure), part 2 (Infrastructure Principles), section 12: Access control and protection.

1.4.4 **TransAdelaide documents**

a) **CP3**

CP-TS-974: Part 4, Operational signage
CP-TS-975: Part 5, Structural clearances
CP-TS-977: Part 7, Structures
CP-TS-980: Part 10, Track support systems
CPRD/PRC/046 Records Management

b) **Quality and Railway Safety Procedure Manual**

QP-IS-501: Document and Data Control

1.4.5 **TransAdelaide drawings**

304-A2-84-1757: Level crossings - details of standard hot mix bitumen construction
727-A4-95-2580: Typical pedestrian maze way arrangement
727-A4-95-2581: Typical single direction pedestrian maze way arrangement
xxxx-xx-xx-xxx: Standard boundary fencing
xxxx-xx-xx-xxx: Standard pedestrian fencing
xxxx-xx-xx-xxx: Standard security (“chain wire”) fencing
xxxx-xx-xx-xxx: Standard security (“spear”) fencing

2.0 FENCES AND GATES

2.1 TYPES OF FENCING

Table 2.1 shows the type and use of various types of fencing:

Table 2.1: Types of fencing

	Required use	Type of fencing	Drawing No.
1	**Boundary fencing** This is the preferred minimum standard fencing to delineate the TransAdelaide rail system boundaries	Post and wire fencing (including gates) or similar	xxxx-xx-xx-xxx
2	**Pedestrian fencing** This is the preferred minimum standard fencing for channelling or directing pedestrians through walkways at the approach to railway stations, pedestrian crossings etc. (except as shown in line 3).	Half height chain wire fencing, nominally 1.1m high (including gates) or similar	xxxx-xx-xx-xxx
3	**Level and pedestrian crossing fencing** This is the mandatory standard fencing on the wing fences of level crossings and pedestrian crossings adjacent to level crossings	"Pool" type fencing, collapsible type - (including gates)	xxxx-xx-xx-xxx
4	**Security fencing** This is the preferred minimum standard fencing to protect secure areas	Chain wire fencing, nominally 1.8m high (including gates); or	xxxx-xx-xx-xxx
5	**Security fencing** This is an enhanced security fencing to protect at risk secure areas	"Spear" fencing nominally 1.8m high (including gates)	xxxx-xx-xx-xxx

2.2 FENCES NOT VISIBLE FROM THE TRACK

For inspection purposes, a schedule shall be maintained of all boundary fences [in accordance with clause 9.1(a)] not visible from the track and which need to be inspected independently from the track walking inspection.

2.3 GATES

2.3.1 Boundary gates

All boundary gates leading into TransAdelaide property shall be identified with a unique number or code, which shall be recorded in accordance with clause 9.1(b).

2.3.2 Signage

Every boundary gate shall be provided with a sign indicating its number or code to enable ready identification, as follows:

a) Signage shall be manufactured in accordance with section 6.

b) Signage shall be erected in accordance with drawing no. ☒
PLAN TO BE PREPARED

2.4 INSPECTION, ASSESSMENT AND MAINTENANCE ACTIONS

Inspection, assessment and maintenance actions shall include the specific conditions shown in table 2.2:

Table 2.2: Fencing inspections, assessment and maintenance actions

Type of inspection or action	Specific conditions or actions to observe
Scheduled inspections	
Walking inspections	a) From the track identify visually and report obvious fencing defects. b) Intervals between walking inspections shall not exceed 31 days.
General inspections	a) Identify and report any damage or deterioration below the design standard of all fencing which is not inspected during the walking inspection (i.e. cannot be seen from the track). b) Intervals between general inspections shall not exceed 12 months.
Unscheduled Inspections	To be undertaken following the report of a damaged, fallen or missing fence.
Assessment and method of assessment	The condition of the fencing if damaged or deteriorated shall be assessed and if considered not to be accomplishing its design purpose, it shall be assessed for repair.
Maintenance actions and response	Repairs shall be carried out as required.

3.0 TRAM STOP ENVIRONS

3.1 PASSENGER PLATFORMS

3.1.1 Platform surfaces and ramps

a) The surface of passenger platforms and ramps shall comply with sub-section 3.2.

b) Two non-skid lines shall be painted on the horizontal surface of each platform edge for the full length of the platform as shown in table 3.1:

Table 3.1: Platform edge lining

Colour	Position	Width of line
Yellow	On edge of platform coping	100mm
White	800mm from and parallel with the edge of the coping	100mm

3.1.2 Pedestrian crossings at passenger platforms

Pedestrian crossings at passenger platforms shall comply with section 4.0.

3.1.3 Platform fencing

Passenger platform fencing shall comply with section 2.0.

3.2 PATHWAYS, RAMPS, STAIRS AND HANDRAILS

The general procedures for the design and construction of pathways, ramps, stairs and handrails shall be in accordance with:

a) the Building Code of Australia, Volume One;

b) AS 1428.1;

c) AS 1428.2; and

d) the Disability Discrimination Act, 1992 (DDA).

3.3 COMMUTER CAR PARKS

3.3.1 TransAdelaide car parks

The design of TransAdelaide car parks at tram stops shall comply with the requirements of AS 2890.1.

3.3.2 Commuter car parks off TransAdelaide property

Commuter car parks at tram stops on adjacent properties shall be the responsibility of the owners of the land. Any access to TransAdelaide property from these car parks shall be provided in accordance with this part of CP3 as necessary.

3.4 INSPECTION, ASSESSMENT AND MAINTENANCE ACTIONS

Inspection, assessment and maintenance actions shall include the specific conditions shown in table 3.2:

Table 3.2: Tram stop environs - inspections, assessment and maintenance actions

Type of inspection or action	Specific conditions or actions to observe
Scheduled inspections	
General inspections	a) Identify visually and report any : 1) passenger platforms that do not comply with the requirements of CP-TS-975 (Structural clearances) and CP-TS-977 (Structures); 2) footpaths which are unacceptable. In particular, walking surfaces must be inspected and any condition that may cause tripping or falling reported. 3) stairs which are sub-standard, i.e. they shall be examined to ensure that the leading edge of all treads are whole, without large chips or holes, all treads are firm without movement and surfaces not slippery. 4) handrails which are not firmly fixed, with movement or are not smooth. 5) painted lines on platforms that are in a worn condition or not clearly visible. 6) road surface of car parks which is below the design standard. b) Intervals between general inspections of tram stop environs shall not exceed 13 weeks.
Unscheduled inspections	To be undertaken following the report of platforms, pathways, ramps, stairs, handrails, tram stop subways or footbridges or car parks being in a state of disrepair.
Assessment & method of assessment	Priority for repair shall be based on the extent of any damage or wear and the risk of personal injury.
Maintenance actions and response	Repairs shall be carried out as required.

4.0 PEDESTRIAN CROSSINGS

4.1 DESIGN AND RATING

4.1.1 Pedestrian crossing types

Pedestrian crossings shall be of the different types shown in table 4.1:

Table 4.1: Types of pedestrian crossings

Type	Description
1	pedestrian crossing adjacent to a protected road crossing [see note 1].
2	pedestrian crossing adjacent to a tram stop and providing access to the passenger platform.
3	pedestrian crossing remote from a road crossing or tram stop.

Note 1: Pedestrian crossings adjacent to level crossing are to be constructed using "pool" type fencing [see table 2.1, line 3]

4.1.2 Siting of pedestrian crossings

The siting of new pedestrian crossings and rating of existing pedestrian crossings shall take into account the following factors:

a) A survey of public needs shall be carried out before any new pedestrian crossing is constructed. Factors which may initiate a need for a pedestrian crossing are:
   1) a request from the public by public meeting or petition;
   2) new housing development on the opposite side of the line from public amenities (e.g. a shopping centre);
   3) increased traffic on a level crossing requiring separation of pedestrian traffic from road traffic.

b) Topography - The selection of a site for a pedestrian crossing shall ensure that sufficient level surface is available either side of the line for the construction of the maze fencing.

c) Approaches - The approaches to the pedestrian crossing need to be off a publicly accessible area on each side of the line and approach pathways shall comply with the Disability Discrimination Act (DDA).

d) Sighting of trams by pedestrians approaching the crossing shall take into account:
   1) track geometry i.e. curves and gradients or changes of gradient;
   2) any obstruction by passenger platforms, location boxes, signal masts, permanent vegetation, fences or any other obstructions.

e) Warning time for pedestrians crossing the line shall take into account:
   1) the distance between the maze ways either side of the track and the time taken to cross between maze ways;
   2) the allowable tram speeds for each location.

4.1.3 Design of maze way fencing

Maze way fences at pedestrian crossings shall be constructed in accordance with drawings nos. 727-A4-95-2580 or 727-A4-95-2581.

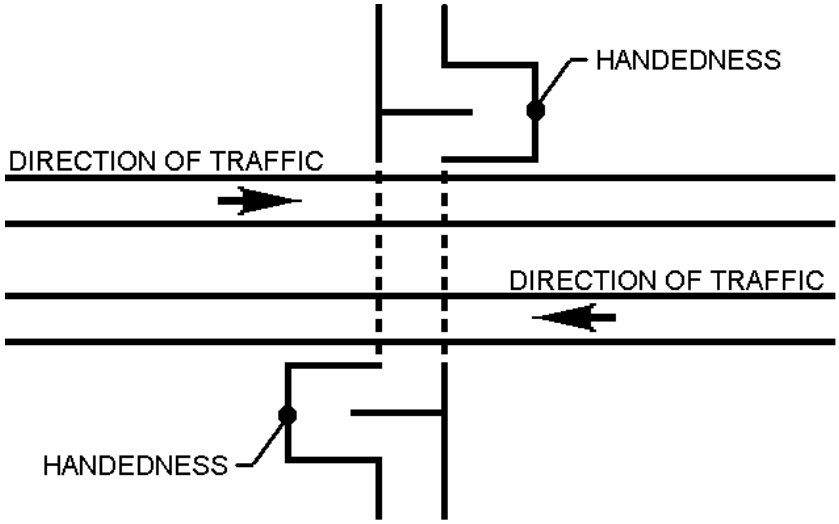
4.1.4 Handedness of maze ways

The handedness of maze way crossings (see figure 4.1) shall take into account:

a) the sighting distance as determined in clause 4.1.2(d) i.e. the fencing shall be arranged to look last before crossing the tracks in the direction of any structures or undergrowth that obscure sighting;

b) on double track, the direction of traffic i.e except as in (a) look last before crossing the tracks towards trams approaching on the nearest track.

Figure 4.1: Handedness of maze way fencing



4.2 SIGNAGE

a) Signage at pedestrian crossings shall be manufactured in accordance with section 6.

b) Signage at pedestrian crossings shall be erected in accordance with drawing no. ⛝

PLAN TO BE PREPARED

4.3 MONITORING AND MAINTENANCE

The inspection, assessment and maintenance of pedestrian crossings shall follow the general procedures prescribed for the inspection, assessment and maintenance of:

a) fences and gates (see section 2),

b) pathways, ramps, stairs and handrails (see under section 3); and

c) non-operational signage (see section 6).

5.0 LEVEL CROSSINGS

5.1 STANDARD DESIGNS

5.1.1 Sleepers

Sleeper type and spacing shall be in accordance with CP-TS-980 (Track support systems).

5.1.2 Roadway surface

a) Where the road surface material consists of bitumen, this shall be laid in accordance with drawing no. 304-A2-84-1757.

b) Flangeways shall be formed against the gauge face of each running rail in accordance with the dimensions shown on drawing no. 304-A2-84-1757.

c) Other designs of infill between rails at level crossings may be used, provided they are of proven design, i.e. subject to stringent validation including physical and extensive field testing.

5.2 APPROACH FENCING (I.E. "WING FENCES")

Standard approach fencing between the roadway and adjacent right of way shall be in accordance with table 2.1, line 3.

5.3 SIGNAGE

Standard signage for vehicular traffic at level crossings shall be manufactured and erected in accordance with AS 1742.7. (Manual of uniform traffic control devices – Part 7: Railway crossings).

5.4 INSPECTION, ASSESSMENT AND MAINTENANCE ACTIONS

Inspection, assessment and maintenance actions shall include the specific conditions shown in table 5.1:

Table 5.1: Level crossing inspections, assessment and maintenance actions

Type of inspection or action	Specific conditions or actions to observe
Scheduled inspections	
Walking inspections	a) From the track identify visually, and report, obvious level crossing rail or road defects. b) Intervals between walking inspections shall not exceed 31 days.
Unscheduled inspections	To be undertaken following the report of a damaged road surface or track defect.
Assessment and method of assessment	The condition of the roadway or track if defective or deteriorated shall be assessed and if considered necessary shall be programmed for repair.
Maintenance actions and response	Repairs shall be carried out as required.

6.0 NON-OPERATIONAL SIGNAGE

6.1 DEFINITION

Non-operational signage includes all signage not defined as operational signage in CP-TS-974 (Operational signage).

6.2 DESIGN FACTORS

The design and detailed drawings of non-operational signage shall include consideration of the following factors:

a) size and shape;

b) colour, lettering and reflectivity;

c) support requirements.

6.3 REGISTER OF NON-OPERATIONAL SIGNAGE

A register of non-operational signage shall be kept in accordance with clause 9.1 (h).

6.4 INSPECTION, ASSESSMENT AND MAINTENANCE ACTIONS

Inspections, assessment and maintenance actions shall include the specific conditions shown in table 6.1;

Table 6.1: Signage inspections, assessment and maintenance actions

Type of inspection or action	Specific conditions to look for or other actions
Scheduled inspections:	
General and detailed inspection	a) Confirm that non-operational signs conform to the approved design, are visible and conspicuous, and are performing the function intended. b) Interval between inspections not to exceed three (3) years.
Assessment and maintenance actions	Repairs or renewals shall be carried out as required.

7.0 MAINTENANCE ROADWAYS WITHIN THE RIGHT OF WAY

7.1 DESIGN AND RATING

Roadways within the right-of-way which are provided for access to the lineside for maintenance of track, signalling and other facilities shall comply with the following preferred specification:

a) Roads shall preferably be located both sides of double tracks (or more) and one side of single track.

b) Roads shall be located within the maintenance access zone (see figure 8.1)

c) Roads shall be located with their near edge a minimum distance from track centre of 3.8m. Where there are obstructions such as overhead support poles, signals, permanent speed limit boards or similar, roads shall be deviated a minimum distance to avoid these facilities.

d) Where the line is built in cuttings or on embankments and there is insufficient width between the track and the edge of the formation to comply with (b) and (c), roads shall be constructed on the land between the edge of the earthworks and the boundary fence but as close to the track as practicable.

e) Where roads are built on top of cuttings, they shall be a sufficient distance from the edge of the cutting to ensure the safety of vehicles and personnel using the road.

f) Roadways shall not interfere with the proper drainage of the right-of-way.

7.2 MONITORING AND MAINTENANCE

Table 7.1: Maintenance roadways inspections, assessment and maintenance actions

Type of inspection or action	Specific conditions or actions to observe
Scheduled inspections	
General inspections	a) Maintenance roadways shall be visually inspected; pot-holes, washed out road surface or other surface faults, or any other repairs that may be needed to be reported. b) Excessive growth of grass or bushes, other than deliberate plantings – see section 8.0, shall be noted during the walking inspection of track where visible from the lineside. c) Roadways shall be inspected as required (see unscheduled inspections).
Unscheduled inspections	To be undertaken following the report of damage.
Assessment and maintenance actions	a) Repairs to maintenance roadways shall be carried out within 31 days. b) Excessive growth shall be removed as soon as practicable along with other seasonal growth.

8.0 LANDSCAPING WITHIN THE RIGHT OF WAY

8.1 DESIGN OF LANDSCAPING

All plantings within the right of way must consider species type and growth habit to provide for the following requirements:

a) sightlines for tram drivers - to be such as to enable drivers to readily see and observe signage, signals, pedestrian crossings, level crossings, platforms etc.;

b) sightlines for road traffic and pedestrian crossing users - to be such as to enable motor vehicle drivers and/or pedestrians to readily see and observe approaching trams;

c) plants to be non-deciduous (ie leaves etc shed by deciduous plants find their way on to the tops of rails causing wheel slide, problems of tram braking and acceleration and low conductivity of track circuits causing signal failure);

d) public safety security sightlines – as a counter to unsociable behaviour, plantings are not to obscure from public observation, waiting passengers or other people using paths or public areas on the tramline reserve;

e) plantings should incorporate species with fire retardant characteristics (ie high salt and moisture content and low volatile oil content in their leaves), plantings should not unduly increase the fuel load;

f) plantings are not to interfere with the annual weed and growth control programme;

g) self-sustainability – plantings are to survive with natural precipitation following the establishment phase;

h) plantings should incorporate plants to control erosion. Avoid inappropriate species that interfere with erosion control and bank stability (ie plants that have allopathic characteristics);

i) maintenance access – plantings should not restrict access to overhead maintenance, signalling equipment cabinets, cable runs, maintenance tracks etc;

j) plantings should where possible improve aesthetics;

k) plantings should have no impact on signals, cables, drains, fences, etc. Note that plantings with deep roots or aggressive suckering habits are not to be placed near underground cables or adjacent to tram tracks, roads or pathways. Plantings favourable to termite colonisation are not permitted in the corridor;

l) plantings may be used to satisfy screening and graffiti control requirements;

m) plantings should incorporate desirable growth characteristics. Refer clearances to rail lines and access for maintenance to the track as shown in figures 8.1 and 8.3.

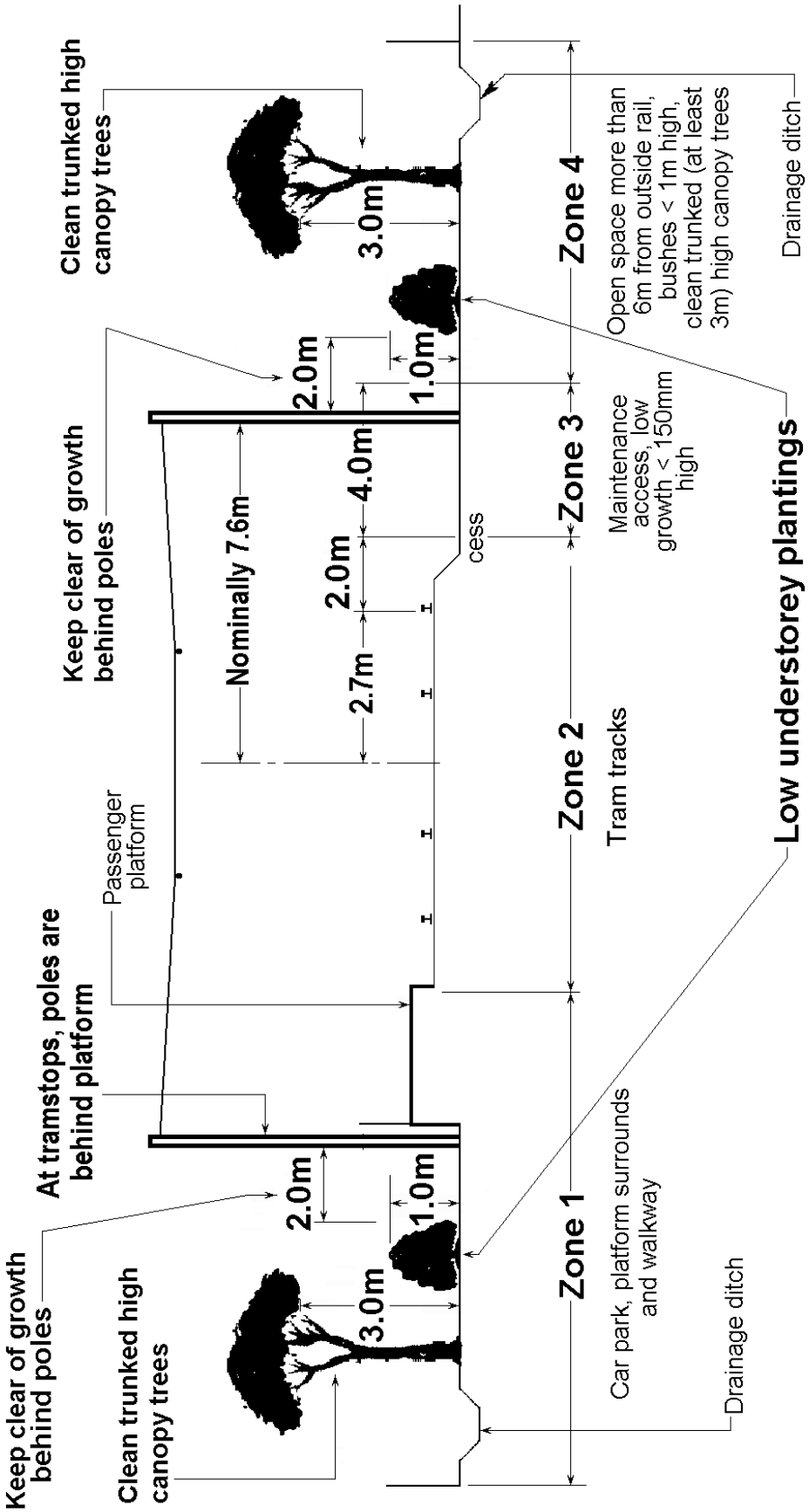


Figure 8.1: Cross-section showing zones

8.2 CLEARANCES TO TRAM LINES

8.2.1 Restricted zone: no plantings

a) In order to ensure appropriate sightlines to signals etc. for tram drivers the planting of trees, shrubs etc in the right of way is restricted to areas outside the envelope shown in figure 8.1. This specifies a restricted zone encompassing the track structure and an area 6 metres either side of the outer rails of the near track.

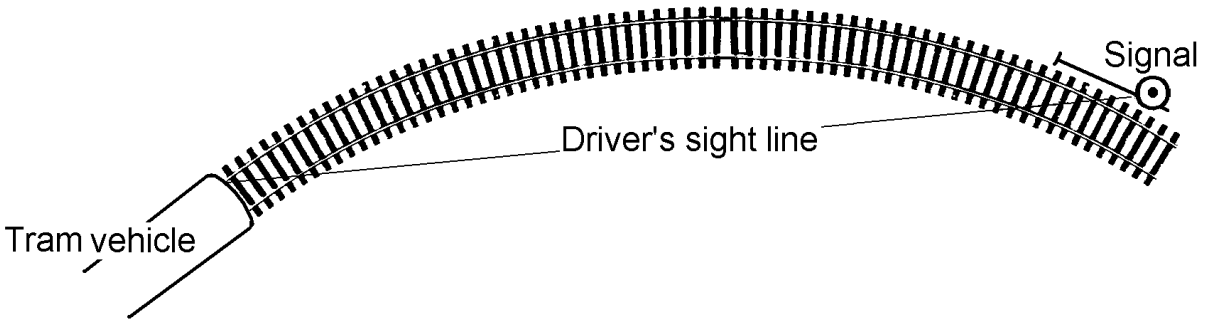
b) Note that where the tramline reserve is only 20 metres wide, zone 4 may be less than 1.2m wide and after allowing for drainage the scope for landscaping may not exist.

c) However, the planting of low growth reaching a height no greater than 150mm may be tolerated on the maintenance access space (zone 3). This growth will be subject to heavy motor vehicle traffic by maintenance workers and will need to be hardy in nature. In some locations a maintenance roadway of hard compacted quarry rubble may be constructed and growth will not be feasible (see section 7.0).

8.2.2 Additional clearance at curves

To accommodate the increased risk of blocking sightlines of signals, level crossings, pedestrian crossings etc, on curves (as shown in figure 8.2), zone 3 in figure 8.1 is to be increased from 4 metres to 8 metres (but not beyond the tramline boundary) for the entire curve length.

Figure 8.2: Curve sightlines



8.3 SECURITY

To ensure the safety of customers at platforms and ensure tram driver sightlines, a viewing area through plantings is essential. This is effected by keeping the low understorey plants below 1 metre high and clean trunked high canopy trees clear up to 3m above ground level as shown in figure 8.1.

9.0 DOCUMENTATION

9.1 SCHEDULES

Schedules shall be maintained in accordance with QP-IS-501 (Document and Data Control) of the following:

a) all fences not visible from the track (refer section 2);
b) gates (refer section 2);
c) passenger platforms (refer section 3);
d) commuter car parks (refer section 3);
e) pedestrian crossings (refer section 4);
f) level crossings (refer section 5);
g) non-operational signage (refer section 6);

SCHEDULES TO BE PREPARED

9.2 INSPECTION REPORTS

All inspection reports shall be maintained in accordance with CPRD/PRC/046 Records Management.