



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline  
Engineering Specification

Category  
Track & Civil

# Supplementary Appendix to ARTC Track & Civil Code of Practice

## Trackside Monuments

### ETD-11-01

#### Applicability

ARTC Network wide	
New South Wales	
Western Jurisdiction	✓
Victoria	✓

#### Primary Source

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## 1 Scope

This document specifies requirements for the location and design of trackside monuments for the following purposes:-

- To monitor the track positions where its stability, both laterally and longitudinally may be at risk.
- To enable track to be located and maintained in its design position.
- To monitor the track position at restricted clearance locations.

## 2 Specification

### 2.1 Monuments for monitoring track stability (Type B)

#### 2.1.1 Position relative to track

Monuments for this purpose shall be located each side of the track so that:-

- They cannot lose their function by the normal action of plant such as ballast regulators, side drain cleaning plant and ballast shoulder cleaners.
- The distance from the track centre to both monuments can readily be measured.
- The longitudinal location of the rails can readily be checked. This may be achieved by stretching a string line between the two monuments placed at right angles to the track, and marking the rail's field faces with punch marks in line with the edge of the monuments. Alternatively this may be achieved by survey.
- Wherever possible they do not foul the structure gauge.

#### 2.1.2 Determination of locations

- (a) Monuments shall be installed at the following locations along the track, the priorities for installation to be determined following site specific risk assessments. The risk assessments shall take into account factors including the following:-
- Where the track has a history of instability.
  - Ballast profile condition.
  - Type and integrity of fastenings.
  - The proximity of fixed points such as turnouts, level crossings and bridges.
  - Train traction conditions such as braking and acceleration.
  - Curve radii.
- (b) The number and location of monuments at a particular site shall be determined by a competent person.

## **2.2 Monuments for maintaining design location (Type A)**

### **2.2.1 Locations**

Monuments for this purpose shall be provided at locations of special concern such as:-

- At curves where faulty alignment exists prior to realignment.
- Where the alignment is difficult to maintain.

They shall be located on one side of the track so that:-

- They cannot lose their function by the normal action of plant such as ballast regulators, side drain cleaning plant and ballast shoulder cleaners.
- The distance from the track center to the monument can readily be measured.
- Wherever possible they do not foul the structure gauge.

### **2.2.2 Locations along the track**

(a) Monuments shall be installed at the following locations along the track, the priorities for installation shall take into account factors including the following:-

- Curve radii.
- Special locations such as turnouts and level crossings.
- Bridges

(b) Monuments shall be located as determined by a competent person. On curves as a minimum they shall be located at the outer and inner tangent points and at the crown point.

## **2.3 Monuments at restricted clearance locations (Type A)**

### **2.3.1 Position relative to track**

Monuments for this purpose shall be located on one or both sides of the track so that:-

- They cannot lose their function by the normal action of plant such as ballast regulators, side drain cleaning plant and ballast shoulder cleaners.
- The distance from the track centre to the monument can readily be measured.
- The relative level of the track to the monument can be measured.
- Wherever possible they do not foul the structure gauge.

### **2.3.2 Locations along the track**

(a) Monuments shall be located where it has been determined that there is a risk of the maximum kinematic rolling stock outline fouling structures or an

adjacent maximum kinematic envelope.

Such structures may include:-

- Overbridges
  - Underbridge structural members
  - Tunnels
  - Platforms and associated awnings
  - Signalling equipment
  - Lineside telephone equipment
- (b) The number and location of monuments at a particular site shall be determined by a competent person, however as a guide they should be placed at :
- 10m intervals for structures on curves
  - 50m intervals for structures on straight track
  - Both ends of structures

## 2.4 Details of monuments

### 2.4.1 Type A

These monuments shall consist of a suitable length of rail (of foot width at least 125mm) or equivalent post concreted securely in the ground.

Datum plates are to be fixed to the post and shall consist of a 12 SWG aluminium plate of minimum size 120 by 250 mm, with an aluminium block fixed to the face of the plate. The upper face of the block should represent the design level of the nearest rail. The datum point is to be fixed to the plate so that once set in position it cannot easily be moved by unauthorised persons.

The following information is to be displayed as required on datum plates:-

- Distance from datum plate to gauge face of nearest rail
- Design superelevation at the location
- Maximum rail level (high rail on curves)
- Curve information - otp, itp
- Track centres where applicable
- Kilometrage of monument.
- Creep datums marked on edge of monument (saw cut or similar) to enable longitudinal movement to be monitored using a string line.

Datum plates may be securely fixed to trackside fixtures such as:-

- Bridge footings/abutments as appropriate
- Platform walls
- Tunnel walls

#### **2.4.2 Type B**

These monuments shall consist of a suitable length of 30mm diameter galvanised pipe (capped to prevent ingress of water) rail or equivalent post, concreted securely in the ground.

Datum plates are to be fixed to the posts at rail level and should consist of a 12 SWG aluminium plate of approximate size 100 by 100 mm.

The following information is to be displayed as required on these monuments:-

- Distance from datum plate to gauge face of nearest rail
- Creep datums marked or notched on edge of monument (saw cut or similar) to enable longitudinal movement to be monitored using a string line.

#### Note

Monuments for may not be required in locations where the rails are positively restrained such as in concrete slab track.

### **2.5 Measurement**

#### **2.5.1 Method of Measurement**

Measurements between the track and monuments shall be carried out directly or by survey.

### **2.6 Tolerances**

At locations where clearances are not restricted the maximum deviation from the designed horizontal alignment as shown on trackside monuments shall not be more than 50mm.

At locations where clearances are restricted, in addition to the relevant information listed in Clause 2.4.1, the site specific design tolerances shall be shown on or adjacent to the monument. Alternatively the clearance register shall include the design tolerances at such locations.

Notwithstanding the above requirements, the track geometry shall be maintained according to the requirements of Sections 5.4 and 5.7 in the ARTC T&C Code of Practice.

## **Appendix 1 – Reference Drawings**

ARTCS3060150      Monuments/Datum Plates for Line Level & Creep