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## SECTION 714 - SIGN INSTALLATION

### 714.01 SCOPE

This section covers the installation of signs and sign supports that comply with:

- the VicRoads Traffic Engineering Manual Volume 2 - Signs and Markings;
- the VicRoads Manual of Standard Drawings for Road Signs;
- Australian Standard AS 1742 Manual of uniform traffic control devices and AS 1743 Road Signs – Specifications.

Cantilever sign structures and sign gantries are outside of the scope of this document.

### 714.02 SUPPLY OF MATERIALS AND COMPONENTS

All materials shall be supplied by the Contractor.

### 714.03 TRANSPORT, HANDLING AND STORAGE OF SIGNS

The Contractor shall collect signs and sign components from the specified storage location and transport them to the specified sign location.

Signs shall be transported, handled stored in a manner that prevents damage to and deterioration of sign components.

If any damage or deterioration should occur to sign components, the Contractor shall repair or replace the affected item. Repairs shall restore the sign to the original condition using proprietary materials obtained from the sign manufacturer or alternative materials compatible with the original.

### 714.04 CONFORMITY WITH DRAWINGS

The sign installation shall be as described in the sign schedule and as shown on the contract drawings.

**If the Contractor proposes to use an alternative method of installation, the Contractor shall submit full details not later than four weeks before the commencement of sign installation to the Superintendent for approval.**

### 714.05 TOLERANCES

#### (a) Foundations

The finished surface of concrete foundations shall be between 50 mm and 100 mm above the finished surface at the base of the sign and shall be shaped to ensure free drainage of water away from the base of the post.

#### (b) Posts

- (i) shall be straight;
- (ii) shall be vertical with a maximum deviation of 1 in 100;
- (iii) post tops shall be 50 mm  $\pm$  10 below the top edge of the sign.

## (c) Signs

- (i) Signs shall be mounted level with a maximum deviation of 1 in 100.
- (ii) Signs shall be mounted symmetrically on their posts unless the drawings indicate that an offset is required or if directed by the Superintendent.
- (iii) Where the sign comprises two or more signs above each other, the individual sign faces shall be mounted with the adjacent edges touching unless otherwise shown on the sign drawings.
- (iv) Sign faces shall present an even surface free from twists, cracks, indentations or any other faults after erection.

**714.06 POSTS AND FOUNDATIONS****HP The required positions of all posts and signs shall be as directed by the Superintendent who shall confirm the positions before the erection of posts commences.**

Post details shall be as shown on the Sign and Post Schedule and in accordance with the contents of Chapter 6 of the Traffic Engineering Manual Volume 2.

**If the Contractor proposes the use of an alternative post and sign installation, full details of the proposals shall be supplied to the Superintendent for review not later than four weeks before installation.**

## (a) Steel and Timber Posts

The Contractor shall conform to the requirements of Clause 714.04 and the Sign and Post Schedule.

Where posts are to be mounted in sockets, the post shall be securely fixed into the socket by an approved vandal-proof method.

Signs to be mounted on two or more posts shall have posts positioned such that the sign face is rotated away from the approaching traffic to avoid direct reflection. Posts shall be positioned such that the sign is rotated away from the cross section by an amount equal to one tenth of the width of the sign (approximately 5°).

Posts specified as frangible hardwood shall be set at a level such that the centre of the lower hole of each post is 75 mm above the finished surface at the base of the post.

## (b) Coatings for Sign Supports

Steel posts shall be hot-dip galvanized in accordance with the Australian Standard for Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.

Sign supports shall be unpainted unless otherwise shown on the drawings. Any paints shall be in accordance with Sections 631 and 641.

## (c) Foundations

All posts shall be set in concrete foundations to the depths shown in the Sign and Post Schedule and with the following hole diameters:

Foundation Hole Diameter	
Post size and type (mm)	Diameter (mm)
32 mm and 50 mm nominal bore steel	225
80 mm to 150 mm nominal bore steel	300
180mm x 100 mm frangible hardwood	300

Concrete used in foundations shall be 20 MPa complying with the requirements of Section 610.

## (d) Posts in Sockets

If a sign is located in a paved area or in a location where the sign may be struck by a vehicle, e.g. at the end of an urban median or where it may be necessary to remove the sign to accommodate the swept path of over-dimensional vehicles, the post should be inserted into a socket cast into the ground. Suitable socket sizes for posts are as follows:

Socket Size	
Post size (mm)	Socket Size (mm)
32 mm nominal bore tube	50 mm nominal bore tube
50 mm nominal bore tube	65 mm nominal bore tube

The depth of the socket should be the same as the depth in ground nominated in Table 6.1 of the Traffic Engineering Manual Volume 2.

The socket should protrude 50 mm above a soil surface or 25 mm above a paved surface.

The sign post must penetrate a minimum 450 mm into the socket.

The sign post should be securely fixed into the socket by an approved vandal-proof method.

The sockets shall be plugged at the bottom and protrude between 20 mm and 30 mm above the finished surface of the concrete foundation.

## (e) Backfilling of Post Holes

## (i) 32 and 50 mm Nominal Bore Steel Posts

- posts holes shall be back-filled with concrete with a nominal strength of 10 MPa.

## (ii) 180 mm x 100 mm Frangible Hardwood Timber Posts

- frangible Hardwood Posts shall be erected in accordance with the drawings;
- post-holes for frangible hardwood posts shall be filled with a mixture of gravel and cement (4% by weight).

## (iii) Slip Base Strutted Aluminium Posts

- slip base strutted aluminium sign posts shall be erected in accordance with the drawings;
- all foundations shall be 400 mm diameter and 1200 mm deep;
- footing plates shall be set in concrete such that the top of the footing plate is between 50 mm and 125 mm above the finished surface at the base of the post or strut;
- vertical posts shall be supplied cut to correct length and with post base and cap installed;
- struts shall be supplied over-length with only the adjustable base installed;
- the Contractor shall cut the strut to the correct length and install the strut-to-post clamp.

**714.07 INSTALLATION OF SIGNS**

Installation of signs shall be in accordance with the Sign and Post Schedule.

Fittings shall be appropriate to the size and type of sign and shall ensure that the sign face is securely connected to the post.

- (a) Signs shall be attached to the post(s) or structures using the type and number of fittings as specified in the schedule or as follows:

Size of Sign	Number of Fittings per Post
Signs up to 200 mm in depth	One
Signs 201 to 900 mm in depth	Two
Signs 901 to 1200 mm in depth	Three
One extra fitting shall be provided per post for each 400 mm increment or part thereof above 1200 mm.	

- (b) For braced signs, the sign shall be attached to the post at every intersection point between the sign bracing member and the post.
- (c) Where a sign assembly consists of two or more signs, the signs shall be mounted in accordance with the sign assembly drawings.
- (d) Signs shall be positioned in accordance with the following tolerances:
- (i)  $\pm 40$  mm of the height specified in the Sign and Post Schedule measured from the bottom of the sign or sign assembly to the lip of the kerb or edge of shoulder nearest the sign;
  - (ii)  $\pm 100$  mm of the pegged sign location or specified location.
- (e) When a sign is to be mounted on frangible posts on a cut batter having a slope steeper than or equal to 2:1, the mounting height at the shorter post may be reduced providing that:
- (i) the uphill corner of the sign is a minimum of 800 mm above the ground;
  - (ii) the sign at the longer post is 2200 mm minimum above the ground.
- (f) If required on the drawings sign faces shall be mounted on existing roadside poles, lighting columns, traffic signal pedestals. Where a sign is to be mounted with stainless steel straps, the brackets shall be attached to the pole using stainless steel straps of 12 mm minimum width and a minimum tensile strength 6.5 kN.

Small signs with an area of not exceeding 0.3 m<sup>2</sup> shall be attached to steel or concrete electricity distribution poles, tramway poles, lighting columns and signal pedestals or mast arms by banding or other proprietary fittings.

Signs exceeding 0.3 m<sup>2</sup> in area may be attached to existing poles (other than electricity distribution poles) provided that the pole has sufficient strength to support the additional loading due to the sign and that special joint-use supports are used.

**If the Contractor proposes to mount a sign on an existing pole, the strength of the pole and any other effects of mounting the sign in this way such as fatigue and durability shall be checked by an experienced structural engineer. Evidence of the structural checking shall be submitted to the Superintendent for review. The Contractor shall obtain permission shall for use of structures which are not VicRoads property.**

The maximum signboard areas which may be attached to joint-use structures are:

- standard 114 mm OD signal pedestal - 1.0 m<sup>2</sup>
- special 165 mm OD signal pedestals - 2.7 m<sup>2</sup>
- joint use traffic signal/lighting column or traffic signal mast arm - 1.6 m<sup>2</sup> less the area of any traffic signal target boards facing in the same direction.

Minimum lateral and vertical clearances adjacent and under the sign shall be maintained.

- (g) Where the drawings indicate that a sign is to face oncoming traffic, it shall be mounted on posts which have been rotated in accordance with the requirements of Clause 714.06(a), with the exception of signs mounted on structures over traffic lanes.
- (h) Where signs are to be removed or relocated, as specified in the schedule, the Contractor shall dismantle and transport the signs, posts and fittings to the specified new location or as directed by the Superintendent. Post holes shall be backfilled and compacted to the finished surface. Relocated signs shall be erected in their new position as specified.
- (i) After erection of each sign all stiffening bars are to be removed.
- (j) Single post mounting for large signs shall be provided if required on the drawings and the schedule. Otherwise single post mountings shall be designed in accordance with Chapter 6 of the Traffic Engineering Manual Vol 2. Such supports are not to be made as breakaway supports.
- (k) Installation of proprietary signs approved by VicRoads shall be in accordance with the supplier's recommendations as modified by VicRoads conditions of approval.

#### **714.08 MASKING OF SIGNS**

Where indicated in the schedule, the Contractor shall mask the nominated sign(s) by placing a porous cloth or similar covering that conceals the sign text under both wet and dry conditions and does not void the sign material warranty. The masking material shall be held in position by wire mesh over the sign.

Adhesive material shall only be applied to the masking material and not be applied to either the front or rear face of the signboard.

Signs marked 'm' in the Sign and Post Schedule shall be masked.

The size of the masking material and its method of attachment shall be such that the sign is:

- effectively and securely covered;
- wholly or partly covered, as required;
- covered at all times and under all conditions.

#### **714.09 REFERENCES**

Traffic Engineering Manual Vol 2, Chapter 6 – Edition 3, December 2001