

SECTION NINETEEN

FIXING RAISED PAVEMENT MARKERS

19.01 DESCRIPTION

This section covers the fixing of both reflective and non-reflective raised pavement markers to asphalt, concrete or sealed pavements using epoxy adhesive or hot melt bitumen adhesive.

19.02 TOLERANCES ON POSITION

Markers shall be affixed to the pavement at the positions shown on the drawings, or specified or directed by the Superintendent within the following limits, unless otherwise specified.

(a) Markers in Line with Broken Line Segments

Transverse position within 25mm of the centreline of the segments.

Longitudinal position within 0.5m of the specified position.

(b) Markers in a Longitudinal Group

Transverse position of the centre of each marker within 25mm of the specified position and within 10mm of a line joining the centres of the end markers of the group.

Longitudinal position of the end markers of the group within 0.5m of the specified position.

Spacing of markers within the group within 50mm of the specified spacing.

(c) Markers Adjacent to Unbroken Line

Clearance to edge of line within 5mm of that specified.

Longitudinal mismatch between markers in transverse pairs at barrier line not more than 25mm.

Longitudinal position of markers within 0.5m or 10% of the specified spacing, whichever is the less.

(d) Orientation of Reflective Markers

Lower edge of the reflective face at 85° to 95° to the centreline of the roadway or any adjacent line.

19.03 MATERIALS

The Contractor shall supply all materials required to complete the work covered by this section, unless otherwise specified.

(a) Markers

Markers shall comply with the relevant requirements of AS 1906, Part 3.

(b) Adhesive

Epoxy adhesive shall be Standard Set or Rapid Set adhesive complying with the relevant requirements of AS 3554.

Hot melt bitumen adhesive shall comply with Section 853.

19.04 MIXING EPOXY ADHESIVE

Adhesive components shall be batched so that the mixed adhesive contains not less than 45% nor more than 55% by volume of either component. Before starting work each day, or when changing to a different batch of adhesive, a hand-mixed colour standard shall be prepared for reference during the day.

When machine mixing is used the mixing equipment shall use positive displacement pumps which proportion the two components in the specified range. At the beginning of each day and at any other time ordered by the Superintendent, the Contractor shall check the proportions in the presence of the Superintendent. Adhesive which has remained in the mixing head for longer than 90 seconds for rapid set adhesive or 180 seconds for standard set adhesive shall be discharged to waste.

When hand-mixing is used not more than 500 g of each component shall be mixed at any time. The components shall be mixed on a flat surface and the mixed adhesive shall be used within 10 minutes of the time the two components are brought together.

Only standard set adhesive shall be mixed by hand, unless the Superintendent consents otherwise.

19.05 PREPARING HOT MELT ADHESIVE

Hot melt bitumen adhesive shall not be used on days of total fire ban without the written approval of the Country Fire Authority. Two nine kilogram Dry Powder extinguishers and one knapsack sprayer shall be carried at all times.

The hot melt bitumen adhesive shall be heated in accordance with the manufacturer's specification in a heater designed specifically for the purpose. It shall be regularly stirred in the heater during the laying operation to maintain uniformity of the component proportions.

19.06 PAVEMENT PREPARATION

The Contractor shall sweep or air blast each marker site as necessary to remove loose material before placing markers. Markers shall only be placed at locations where the pavement is free from dirt, oil, grease, paint, or any other material which would adversely affect the bond of the adhesive to the pavement, unless otherwise specified. Locations at which markers have not been placed because the pavement cannot be cleaned effectively shall be reported to the Superintendent each day in writing who will direct the course of action to adopt.

If required by the contract specific clauses, the Contractor shall clean the pavement at every marker site by sand blasting, chipping or burning of bitumen, grease, or oil as appropriate to ensure that the surface is clean and sound.

19.07 PLACING MARKERS

Markers shall not be placed in any of the following circumstances:

- when the pavement is wet;
- when the relative humidity is greater than 80%; or
- when the ambient temperature or the temperature of the road surface is less than 15°C for standard set adhesive or 0°C for rapid set or hot melt adhesive.

Epoxy adhesive shall be placed on the base of the marker in such quantity and manner as to completely cover the base of the marker and extrude slightly all round when the marker is placed on the road. The marker shall be then positioned correctly on the pavement and pressure shall be applied until the adhesive is uniformly extruded from each edge of the base of the marker indicating that the full base area is supported by adhesive. The thickness of adhesive remaining under the marker shall be approximately 1mm. The orientation and position of the marker should then be visually checked and if necessary immediately corrected.

Hot melt bitumen adhesive shall be placed on the road in the correct position and the marker quickly placed, correctly orientated and pressed into the adhesive.

Adhesive of either type on the exposed surfaces of the marker shall be removed using soft rags moistened with kerosene, petrol, or mineral turpentine. Any adhesive on the pavement which might obscure the reflective faces or aspect of the marker shall be removed using a square-ended spatula or similar.

Where a marker is not positioned correctly within 10 seconds for hot melt bitumen adhesive, 2 minutes for rapid set machine mix adhesive, 4 minutes for standard set machine mix, or 10 minutes for standard set hand mix from the time mixing commences, it shall be discarded and a new marker placed.

Similarly, any marker dislodged by traffic after these times up to the end of the maintenance period shall be removed and replaced with a new marker.

On concrete and asphalt pavements, wherever possible markers shall be placed clear of longitudinal or transverse joints and on all pavements markers shall be placed clear of any surface cracks or positions from which markers have been removed and the surface is damaged.

19.08 PROTECTION FROM TRAFFIC

Markers shall be protected from traffic after placing for periods not less than those shown in Table 710.081 below, unless the Superintendent directs or consents otherwise.

Table 19.081

Ambient Temperature (°C)	Standard Set Adhesive (hours) (min)	Rapid Set Adhesive (minutes) (min)	Hot Melt Adhesive (minutes) (min)
35	1¼	25	4
30	2	30	4
25	3½	35	3
15	6	40	3
10	-	45	2
5	-	60	2
0	-	85	2