# Road Furniture And Traffic Control Devices

DIPL Roadworks Master - May 2019

## Cross Reference

PAVEMENT MARKING for Audio Tactile Pavement Marking.

## Standards and Publications

Conform to the following Standards and Publications unless specified otherwise:

AS 1012(set) Methods of testing concrete

AS 1074 Steel tubes and tubulars for ordinary services

AS 1111(set) ISO metric hexagon commercial bolts and screws

AS/NZS 1112(set) ISO metric hexagon nuts, Including thin nuts, slotted nuts and castle nuts

AS/NZS 1252 High strength steel fastener assemblies for structural engineering - Bolts, nuts and washers for structural engineering

AS 1273 Unplasticised PVC (UPVC) downpipe and fittings for rainwater

AS 1397 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium

AS 1428.4.1 Design for access and mobility – Means to assist the orientation of people with vision impairment - Tactile ground surface indicators

AS/NZS 1554(set) Structural steel welding

AS/NZS 1594 Hot rolled steel flat products

AS 1604.1 Specification for preservative treatment – Sawn and round timber

AS 1722 Pipe threads of Whitworth form - Fastening pipe threads

AS 1725(set) Chain link fabric fencing

AS/NZS 1734 Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate

AS 1742(set) Manual of uniform traffic control devices

AS 1743 Road signs - Specifications

AS 1744 Standard alphabets for road signs

AS/NZS 1906(set) Retroreflective materials and devices for road traffic control purposes

AS/NZS 1906.1 - Retroreflective sheeting

AS 2423 Coated steel wire fencing products for terrestrial, aquatic and general use

AS 2700(set) Colour standards for general purposes

AS 2759 Steel wire rope – Use, operation and maintenance

AS/NZS 3845.1 Road safety barrier systems and devices - Road safety barrier systems

AS/NZS 4680 Hot dip galvanized (zinc) coatings on fabricated ferrous articles

AS 4687 Temporary fencing and hoardings

APAS 1441/1 Permanent graffiti barrier, clear, exterior

APAS 1442/1 Temporary graffiti barrier, clear, exterior

APAS 1443 Graffiti Remover

NTMTM NT Materials Testing Manual accessible via <https://transport.nt.gov.au/infrastructure/technical-standards-guidelines-and-specifications/materials-testing-manual>

NTTM NT Test Methods

## Definitions

CS Civil Standard drawing. Use the most recent version.

GRAFFITI: The name for images or lettering scratched, scrawled, painted or marked in any manner on property.

LONGITUDINAL LINES: Any line which runs parallel to the road centre line, e.g. broken line, edge line, separation line, barrier line.

OTHER MARKINGS: All diagonal lines, chevron markings and messages on the pavement, including symbols, words, numerals, arrows and kerb markings.

TACTILE GROUND SURFACE INDICATOR (TGSI) A device, or a number of devices, installed on a surface in a pedestrian path of travel, designed to provide pedestrians who are blind or vision-impaired with warning or directional orientation information.

TRAFFIC CONTROL DEVICE: Any sign, signal, pavement marking or other installation placed or erected for the purpose of regulating, warning, guiding or providing for the safety of road users. It does not include temporary warning devices and control measures erected only for the construction period.

TRANSVERSE MARKINGS: Any line which is at right angles to the centre line of the road, e.g. stop line, hold line, pedestrian cross walk

## Tactile Ground Surface Indicators – Witness Point

Devices used must conform to AS 1428.4.1.

Use precast concrete units.

**Witness Point** – Provide a 5 year warranty for the materials used, and for the devices installed as tactile ground surface indicators. Provide a 5 year warranty for the workmanship for the installation of the tactile ground surface indicators. Both warranties to be in the name of the Principal.

## Fencing

### General

Clearing fence lines includes the removal of trees, shrubs, vegetable matter and debris. Grub out all roots that interfere with the placement of posts.

Erect fences so that the line of the tops of the posts is uniform.

Adjust the position of posts to compensate for the irregularities of the ground.

Provide gates where specified and across existing access tracks or roads.

### Existing Fences

Install a post at the intersection of new fence with existing fence and fix the wiring of both fences to that post.

Complete the necessary sections of new fencing before removing or opening a boundary or internal fence.

[Not suitable for removal and re‑erection of fencing. Delete one of the options]

Obtain owner's agreement to proposed removal.

Notify the occupier in writing of the date the fence will be removed.

Erect gates or grids at fence openings as specified.

### Materials

Barbed wire: 1.57 mm diameter minimum, high tensile.

Plain wire: 2.50 mm diameter minimum, high tensile.

Wire mesh: Galvanized 3.15 mm diameter x 50 mm chain mesh.

### Stock Fence

Stock fencing to consist of tubular steel strainer assemblies with star pickets and galvanized wire. Construct as specified on Civil Standard Drawing CS 3310.

Include the crossing of gullies, watercourses and hollows on the ground.

### Security Fence

Security fencing to consist of tubular steel posts complete with post caps, cable straining wires, chainwire mesh and three barbed wires. Construct as specified on Civil Standard Drawing CS 3308.

### Temporary Site Safety Fence

Refer to PROJECT SPECIFIC REQUIREMENTS in the RFT/RFQ.

Materials, construction, and installation to AS 4687.

Erect the fence in accordance with manufacturer's and/or supplier’s specifications. Ensure installation methods are consistent with possible local weather events.

This sub-clause is not applicable to temporary road safety barriers for works. Refer to PROVISION FOR TRAFFIC, **NT Specific Directions for Road Work Signs** clause, **Road Safety Barriers** sub-clause, for temporary road safety barriers.

### Pedestrian Fence

To civil standard drawing CS 3307.

Refer to AS 1742.10, Pedestrian Fencing clause.

### Log Barrier Fence

Refer to **Recycled Plastic Bollards** sub-clause.

Provide log barrier fencing consisting of close spaced vertical bollards.

Use recycled plastic bollards or Stringybark, Woollybutt or Pine timber, pressure impregnated with ACQ preservative formulation, copper oxide (CuO) and quaternary ammonium compound (DDAC) to Category H4 of AS 1604.

Do not use preservative treatments that contain arsenic or chromium.

### Vehicle Movement Barriers/Fences

As per Civil Standard Drawing CS 3305.

Supply stock & half stock length pipe barriers.

Erect fences as ordered, so that the line of the tops of the posts is uniform.

Make allowance for excavation and concreting of anchor/footings.

Adjust the position of posts to compensate for the irregularities of the ground.

Minor clearing fence lines may include the removal of trees, shrubs, vegetable matter and debris. Grub out all roots that interfere with the placement of posts.

### Cyclist Holding Rails

Supply and erect new cycle grab rails and delineators as per Civil Standard Drawings numberedCS 3302 and CS 3305

Or

Remove damaged rail and replace with new rail as per drawing.

Make allowance for excavation and concreting of anchor/footings.

Make allowance for minor clearing of fence lines

### Recycled Plastic Bollards

Supply round pre-moulded recycled plastic bollards, 1.5 m length x 150 mm dia with built in colours and UV stabilised, resistant to termites, microorganisms and moisture.

Install and ensure security of recycled plastic bollards as per manufacturer’s recommendations.

Make allowance for excavation and concreting of anchor/footings.

Make allowance for minor clearing of fence lines.

### Culvert Crossing Guard Rail

Supply and erect Culvert Crossing Guard Rail rails and delineators as per drawing.

Make allowance for Hot Dip galvanising and masonry chemical anchorage to headwalls.

Make allowance for excavation and concreting of anchor/footings. Refer to Civil Standard Drawing CS 3306.

Make allowance for minor clearing of fence lines.

Or

Remove damaged Culvert Crossing Guard Rail and replace with new rail as per drawing.

Make allowance for excavation, removal and rehabilitation of anchor/footings.

## Guide Posts

### Posts

Use THERMOPLASTIC guide posts manufactured from plastic alloy ASA/PC or similar.

Refer to Civil Standard Drawing CS 3500.

REQUIREMENTS

Posts to conform to the following:

* Colour: Opaque white.
* Finish: Smooth, glossy.
* Installation tolerance: Height to be 1100mm to 900mm above finished surface.
* Length: 1380 mm.
* Width: 95 mm minimum, 105 mm maximum, width to be constant to within 1 mm.
* Web thickness: 3 mm minimum, 5 mm maximum.

### Certification of Guide Posts – Hold Point

**Hold point -** Provide certification that guide posts conform to the following:

* Where installed in normal working conditions, guide posts are capable of self erecting after 10 impacts head on, from an average sedan travelling at 60 kilometres per hour.
* After 2,000 hours of exposure in an Atlas Weatherometer the guide posts do not change colour by more than 10 points on a Delta E colour chart.
* The guide post material has a minimum vicat softening point of 120°C.
* Physical testing as specified.
* Resistant to termites.

### Guide Post Characteristics – Hold Point

Provide guide posts which have the following:

* An anti‑withdrawal device which will prevent the guide post from being withdrawn without dislodgement of the compacted backfill. Anti-withdrawal devices must be engaged on each and every guide post prior to installation of guide posts.
* Legible and indelible markings similar to those used to mark UPVC sewer and water pipes, in letters no less than 5 mm high, showing month and year of manufacture and located approximately 400 mm from the top of the post. Stick-on labels are not permitted.
* Legible and indelible marking 380 mm from the bottom of the guide post, to indicate depth for installation.

**Hold point -** Provide a sample guide post from each batch purchased for this contract for approval before installing any guide posts.

### Delineators

RECTANGULAR RETROREFLECTORS

To be of Class 1A retroreflective material.

Size to be 200 mm x 50 mm for red delineators and for white delineators. Area minimum 100 cm2 (10,000 mm2).

DISCRETE DEVICE TYPE RETROREFLECTORS

Maximum projected face area for red delineator devices and white delineator devices to be 100 cm2 (10,000 mm2). Minimum length of shortest projected dimension to be 60 mm.

[Not to be used except to denote special hazards. Ensure hazard is identified on appropriate drawing]

### Installation of Delineators

Attach one red and one white delineator to each guide post, 50 mm from the top of the post.

The red delineator to be attached to the convex side of curved guide posts where applicable.

Attach any discrete device type retroreflectors required as specified.

[Ensure drawings are included]

Red delineators to be on the left and white delineators to be on the right when viewed in the direction of travel.

## Road Signs

### General

This subsection specifies the manufacture, supply, delivery and erection of road signs.

### Anti-spear fixings for hazard markers (sight boards)

Hazard markers (D4-1-1A), and other signs at similar heights, which are installed parallel to the path of travel of traffic, require anti-spear fixings.

Hazard marker signs are to comprise two D4-1-1A signs, mounted end to end.

The bracing rails are to be aluminium extrusions, each made up of two equal length sections, spliced at the centre line. The aluminium extrusions are to be Capral EK8891S WA Type A, or Ullrich UA6490, or equal equivalent.

The construction details are shown on the Queensland Department of Transport and Main Roads Standard Drawing No. 1452, Sheets 1, 2, and 3. This Standard Drawing can be accessed via

<https://www.tmr.qld.gov.au/-/media/busind/techstdpubs/Specifications-and-drawings/Standard-Drawings-Roads/Roadworks-Drainage-Culverts-and-Geotechnical/SD1452.pdf?la=en>

Any annotation on the Queensland Standard Drawing Sheets which refer to additional Queensland specifications, concrete footings, and steel posts are to be disregarded, and the Northern Territory requirements are to be met – refer to Northern Territory specifications in this document and, if applicable, in other Northern Territory specifications documents.

### Materials – Hold Point

NON‑REFLECTIVE MATERIALS

In accordance with AS 1743.

REFLECTIVE MATERIAL

Use high intensity Class 1 standard in accordance with AS 1906.1 for all signs, including temporary signs, and hazard markers with the exception that all black legends are to be non‑reflective.

BLANKS

Use aluminium marine grade alloy designation 5052 ‑ H38. Thickness 1.6 mm.

Steel sheets may only be used for temporary signs.

MANUFACTURE

Chemically clean aluminium blanks before painting or bonding of reflective material.

Stamp the month and year of manufacture and the symbol DIPL on the backs of all signs.

POSTS

Post sizes to conform to the ***Table - Roadside Signs - Mounting Selection*** unless specified otherwise.

Road signs mounting pole sizes other than the sizes shown in the ***Table - Roadside Signs - Mounting Selection*** are:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table - Roadside Signs – Non Standard Mounting Poles Selection** | | | | | | |
| **Location** | **Sign size W x D (mm)** | **No. and NB Gal. Pipe Posts** | **Brackets or M8 bolts per post** | **Bracing req. (Yes/No)** | **Footing** | |
| **Depth (mm)** | **Dia. (mm)** |
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|  |  |  |  |  |  |  |
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*[Delete this clause and the table if no non-standard pole sizes are required.]*

Posts to be medium grade galvanized pipe with plain ends and constructed from a single length of pipe. Cap each post with a galvanized cap. Do not use “Ingal” posts.

Standard; to AS 1074.

ANTI-GRAFFITI COATING

**Hold Point –** Obtain Superintendent’s approval for the use of anti-graffiti film or coating products. Apply anti-graffiti products only to the new road signs specified by the Superintendent.

[All roads Project Officers BE AWARE that 3M warrants their road signs only if their anti-graffiti film is used. Use of non-3M anti-graffiti product voids the 3M warranty.]

| **Table – Roadside Signs – Mounting Selection** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Sign Size**  **W x D** | **No. and NB Gal. Pipe Posts** | **Sign Attachment Brackets (Or M8 Bolts) Per Post** | **Bracing** | **Footing** | |
| **Depth (mm)** | **Dia. (mm)** |
| 300 x 300 | 1 x 50 | 2 | No | 600 | 300 |
| 300 x 450 | 1 x 50 | 2 | No | 600 | 300 |
| 450 x 450 | 1 x 50 | 2 | No | 600 | 300 |
| 450 x 300 | 1 x 50 | 2 | No | 600 | 300 |
| 450 x 600 | 1 x 50 | 2 | No | 600 | 300 |
| 450 x 750 | 1 x 50 | 2 | No | 600 | 300 |
| 450 x 900 | 1 x 50 | 2 | No | 600 | 300 |
| 600 x 450 | 1 x 50 | 2 | No | 600 | 300 |
| 600 x 600 | 1 x 50 | 2 | No | 600 | 300 |
| 600 x 750 | 1 x 50 | 2 | No | 600 | 300 |
| 600 x 900 | 1 x 50 | 3 | No | 600 | 300 |
| 600 x 1050 | 1 x 50 | 3 | No | 600 | 300 |
| 750 x 450 | 1 x 50 | 2 | No | 600 | 300 |
| 750 x 600 | 1 x 50 | 2 | No | 600 | 300 |
| 750 x 750 | 1 x 50 | 2 | No | 600 | 300 |
| 750 x 900 | 1 x 50 | 2 | No | 1500 | 300 |
| 750 x 1200 | 1 x 50 | 3 | No | 1000 | 300 |
| 900 x 300 | 1 x 50 | 2 | Yes | 600 | 300 |
| 900 x 600 | 1 x 50 | 2 | Yes | 600 | 300 |
| 900 x 900 | 1 x 50 | 3 | Yes | 600 | 300 |
| 900 x 1350 | 1 x 50 | 4 | Yes | 1000 | 300 |
| 1050 x 600 | 1 x 50 | 2 | Yes | 1000 | 300 |
| 1050 x 900 | 1 x 50 | 3 | Yes | 1000 | 300 |
| 1200 x 600 | 2 x 50 | 2 | Yes | 600 | 300 |
| 1500 x 800 | 2 x 50 | 2 | Yes | 1000 | 300 |
| 1800 x 600 | 2 x 50 | 2 | Yes | 1000 | 300 |
| 1800 x 1200 | 2 x 80 | 4 | Yes | 1000 | 300 |
| 2400 x 1200 | 2 x 80 | 4 | Yes | 1200 | 450 |
| 2400 x 1800 | 2 x 100 | 5 | Yes | 1200 | 450 |
| 3000 x 600 | 2 x 50 | 2 | Yes | 1000 | 300 |
| 3000 x 1200 | 2 x 80 | 4 | Yes | 1200 | 450 |
| 3000 x 1800 | 2 x 100 | 5 | Yes | 1500 | 450 |
| 3700 x 600 | 2 x 80 | 2 | Yes | 1000 | 300 |
| 3700 x 1200 | 3 x 80 | 4 | Yes | 1200 | 450 |
| 3700 x 1800 | 3 x 100 | 5 | Yes | 1500 | 450 |
| 3700 x 2400 | 4 x 100 | 7 | Yes | 1500 | 450 |
| 4300 x 600 | 2 x 80 | 2 | Yes | 1000 | 300 |
| 4300 x 1200 | 3 x 80 | 4 | Yes | 1200 | 450 |
| 4300 x 1800 | 3 x 100 | 5 | Yes | 1500 | 450 |
| 4900 x 600 | 3 x 80 | 2 | Yes | 1000 | 300 |
| 4900 x 1200 | 3 x 100 | 4 | Yes | 1200 | 450 |
| 4900 x 1800 | 3 x 100 | 5 | Yes | 1500 | 450 |
| 5500 x 600 | 3 x 80 | 2 | Yes | 1000 | 300 |
| 5500 x 1200 | 3 x 100 | 4 | Yes | 1200 | 450 |
| 5500 x 1800 | 4 x 100 | 5 | Yes | 1500 | 450 |
| 6100 x 600 | 3 x 80 | 2 | Yes | 1000 | 300 |
| 6100 x 1200 | 3 x 100 | 4 | Yes | 1200 | 450 |
| 6100 x 1800 | 4 x 100 | 5 | Yes | 1500 | 450 |

### Supply and Delivery

Supply all brackets, bolts, nuts and bracings.

Fix bracings to the signs prior to delivery.

### Location

Signs to be located clear of vegetation and be clearly visible under headlight illumination.

LATERAL PLACEMENT

[Ensure the sign location is shown on the drawings and is designed to allow easy sighting, for ease of road maintenance, and in compliance with design requirements.]

Lateral placement to be measured to the edge of the sign nearest the road.

Lateral placement to be as follows:

Unkerbed roads: 2 to 4 m clear from the edge of the traffic lane, and 600 mm minimum clear from the outer edge of the road shoulder.

Kerbed roads: 500 mm to 1000 mm from the front face of the kerb.

HEIGHT

Height to be measured as the clearance to the lowest edge of the lowest sign in an assembly.

Heights for signs to be as follows:

|  |  |
| --- | --- |
| **Table – Heights for signs** | |
| **Unkerbed Roads** | |
| Fingerboard (G3) and  street name signs (G5): | 2 m above the near edge of the pavement. |
| Other signs: | 1 m to 1.5 m above the near edge of the pavement. |
| **Kerbed Roads:** | |
| Signs overhanging a footway: | 2.5 m minimum above footway. |
| Signs not overhanging a footway: | 1 m to 1.5 m clearance except for those specific signs on medians and islands given below. |

|  |
| --- |
| **Table – Height of specific signs on medians and islands** |
| The following signs, when used on medians and islands, to have a clearance 150 mm above the kerb: |
| D4‑1‑2 Hazard Marker |
| D4‑2‑2 Hazard Marker |
| D4‑3 Hazard Marker |
| R2‑3 (Keep Left) (Keep Right) |
| R2‑5 (No U Turn) |
| R2‑6 (No Right Turn) (No Left Turn) |
| R2‑15 (U Turn Permitted). |

### Installation

Conform to the ***Table Roadside Signs - Mounting Selection*** in **Materials** sub-clause in **Road Signs** clause in this work section.

Install posts vertically.

Provide and install a galvanised steel sleeve when installing sign posts in concreted or paved medians.

Sleeves, when specified, to be 50 mm longer than the specified ground anchor (footing) depth and extend 50 mm above the finished surface level.

Attach the post to the sleeve with a galvanized M10 bolt, 25 mm from the top of the sleeve. Encase the post, or sleeve when used, in a footing of 20 MPa concrete.

Orientation of sign face: Vertical, and turned 3 degrees to 5 degrees horizontally from oncoming traffic on straight sections. On curves, at right angles to centre line of road.

Exception: Parking signs to be oriented 5 degrees from parallel to the kerb to face oncoming traffic.

### Reinstatement and Relocation of Existing Signs

Dismantle existing post and signs carefully.

Store in a manner to prevent damage.

Backfill the hole left by the post and its footing and compact the fill to the same density as the surrounding area.

Erect signs in new locations as shown on the drawings.

GENERAL REQUIREMENTS

* Spacing between posts:

- 2 post signs ‑ 0.6 times sign width.

- 3 post signs ‑ 0.4 times sign width.

- 4 post signs ‑ 0.3 times sign width.

* Brace spacing to be 380 mm maximum.
* Adopt the nearest size in the list for intermediate sizes.
* Post sizes for galvanized pipe posts are for sign clearance of less than 2 m above the pavement. For sign clearances greater than 2 m, increase the nominal diameter of the pipe size by a percentage equal to the percentage increase in height above 2 m.
* Where signs are erected in groups treat the overall dimensions of the group as one sign size to determine the post requirement from the ***Table Roadside Signs - Mounting Selection*** in **Materials** sub-clause in **Road Signs** clause in this work section.

## Flood Gauge Posts

### Posts and Gauges

Use a standard flood gauge in accordance with Civil Standard Drawing CS 3501.

Use galvanized posts, single length 150 mm x 50 mm x 3 mm RHS with a 3 mm end cap welded to the top.

Paint welds with zinc rich organic paint to APAS specification 2916.

### Installation

Erect the post vertically at the outer edge of the road shoulder or margin, on the left hand side when viewed in the direction of travel.

Install a concrete anchor, of 20 MPa concrete, with a depth of 650 mm and a diameter of 300 mm.

Cast a suitable galvanized sleeve, 650 mm in length, in the anchor so that the sleeve extends 50 mm above the finished surface level.

Attach post to sleeve with a galvanized M10 bolt 25 mm from the top of the sleeve.

Secure gauge to post with No 10 galvanized Tek screws or 4 mm blind pop rivets at 300 mm centres staggered alternately each side.

Position gauge zero to comply with lowest spot on floodway along the centre line.

## Cattle Grids

Construct grids to the details shown on the Civil Standard Drawings CS 3310, CS 3313, CS 3314, and CS 3315.

Place the grid centre line on the centre line of the road pavement.

The grid grade and levels to conform to the grade and levels of the adjacent road pavement.

Place and compact select fill behind the abutments of the grid, up to the base of the pavement.

Reinstate pavement layers with base material.

Reinstate surface.

Tighten all hold down bolts as specified.

Paint the portion of guardrails above ground with one coat zinc phosphate primer and two coats of white alkyd paint.

Fix width markers with epoxy adhesive to each guardrail.

Construct strainer post assemblies as specified.

Fix the stock fence to the strainer assembly.

Supply and install a gate in the fencing adjacent to the grid as specified.

Refer to Civil Standard Drawings CS 3310 and CS 3312.

[Ensure that the required Standard Drawings are included. Delete reference to drawings not applicable to project.]

## Road Safety Barriers - Steel Beam Guardrail System

### Materials

Refer to Civil Standard Drawing CS 3200.

RAILS

Use W‑beam guardrail to AS/NZS 3845.1 of nominal 300 mm width formed from HA 350 steel to AS/NZS 1594.

Rails to be capable of withstanding a cold bend of 180 deg. around a diameter 2.5 times its own thickness without cracking.

Base metal thickness to be 2.7 mm minimum.

TERMINAL SECTIONS

Form from HA 350 steel having the same properties and thickness as the rails.

POSTS

Fabricate posts and block outs from steel channel section in accordance with standard drawings.

BOLTS AND NUTS

Shape bolt shoulders and holes in rail elements to prevent the bolts from turning.

Length of bolts to be sufficient to extend 6 mm to 12 mm beyond the nuts.

GALVANIZING

Galvanize all components by hot dip galvanizing, after fabrication, to AS 4680.

Where the galvanising on guard rail or associated fittings has been damaged, the coating shall be repaired by regalvanising or by painting with a minimum of two coats of a zinc‑rich inorganic paint in accordance with AS/NZS 3750.9 and one coat of aluminium paint.

### Compliance

**Marking of materials -** To AS/NZS 1594

Each coil or shipping unit shall be clearly and durably marked or tagged to indicate the following:

(a) Steel grade designation.

(b) Dimensions.

(c) Name or registered trade name or mark of the manufacturer.

(d) Batch identification.

If the marked portion of the material is subsequently removed then these markings are to be transferred to each remaining portion of the material.

**Traceability of components -** To AS/NZS 3845 Part 1

(a) All steel rails, posts and other critical components shall be permanently marked in lettering at least 10 mm high with the name of System Manufacturer, the date and month of manufacture the grade of steel and base metal thickness (BMT) to allow the product to be traced.

(b) Where plastic components make up a key element of the system, they shall be permanently marked clearly indicating the month and year of manufacture in a location that can be easily inspected.

(c) Bolts shall be marked in accordance with AS 1111.1 or AS/NZS 1252.

**Certificate(s) of compliance - AS/NZS 1594**

Provide certificate(s) of compliance from the manufacturer that the steel used in the manufacture of the steel beam guardrails is of structural grade HA 350.

**Certificate(s) of compliance - AS 4680**

Provide certificate(s) of compliance from the galvanizer that the galvanizing complies with AS 4680.

### Installation

Erect the rail in a manner that produces a smooth, continuous, taut rail closely conforming to the line and grade of the roadway.

Lap rails so that the ends of rails do not face oncoming traffic in the adjacent lane.

Attach reflective delineators to the guardrail in accordance with the manufacturer's specification.

Delineator heights to match heights of delineators on guide posts.

Delineator dimensions shown in **Guide Posts** clause, **Delineators** sub-clause in this work section.

## Road Safety Barriers – Steel Wire Rope System – Hold Point

Materials and installation to AS/NZS 3845.1 and to AS 2759.

**Hold Point** – Obtain Superintendent’s approval for any proposed Steel Wire Rope Road Safety Barrier System before ordering any components.