

CAPRICORN MUNICIPAL DEVELOPMENT GUIDELINES

SIGNPOSTING

C262

CONSTRUCTION SPECIFICATION

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Keeping the Capricorn Municipal Development Guidelines up-to-date

The Capricorn Municipal Development Guidelines are living documents which reflect progress of municipal works in the Capricorn Region. To maintain a high level of currency that reflects the current municipal environment, all guidelines are periodically reviewed with new editions published and the possibility of some editions to be removed. Between the publishing of these editions, amendments may be issued. It is important that readers assure themselves they are using current guideline, which should include any amendments which may have been published since the guideline was printed. A guideline will be deemed current at the date of development approval for construction works.

GENERAL

C262.01 SCOPE

1. The work to be executed under this Specification consists of:
 - (a) the supply and erection of the Regulatory, Warning, Guide, Information and Direction signs as described in MUTCD.
 - (b) the supply and erection of sign support structures to support the signs, and
 - (c) the adjustment of existing signs and sign support structures.

2. Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited Annexure C262A.

Quality

C262.02 REFERENCE DOCUMENTS

1. Documents referenced in this Specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated.

**Documents
Standards Test
Methods**

(a) Council Specifications

- C201 - Control of Traffic
C271 - Minor Concrete Works

(b) Australian Standards

- AS 1163 - Structural steel hollow sections
AS 1214 - Hot-dip galvanised coatings on threaded fasteners
AS 4100 - Steel structures
AS 3990 - Steelwork for engineering applications
AS 1379 - The specification and manufacture of concrete
AS/NZS 1554.1 - Welding of steel structures
AS/NZS 1580.602.2 - Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°
AS 1580.108.2 - Dry film thickness - Paint inspection gauge
AS/NZS 4680 - Hot dipped galvanised (zinc) coatings on fabricated ferrous articles
AS 1734 - Aluminium and aluminium alloys - flat sheet, coiled sheet and plate
AS 1866 - Aluminium and aluminium alloys - extruded rod, bar, solid and hollow shapes
AS 2700 - Colour standards for general purposes
AS 3678 - Structural steel - hot-rolled plates, floor plates and slabs
AS 3679.1 - Structural steel - hot-rolled bars and sections

(c) Queensland Department of Main Roads Publications

- MUTCD - Manual of Uniform Traffic Control Devices.

C262.03 PROVISION FOR TRAFFIC

- | | |
|---|---|
| 1. The Contractor shall provide for traffic in accordance with the requirements of the Specification for CONTROL OF TRAFFIC C201 while undertaking the work and shall organise the work to avoid or minimise delays and inconvenience to traffic. | <i>Minimise Inconvenience</i> |
| 2. Where a sign is erected before its intended use by traffic and is visible to traffic, the face of the sign shall be completely and securely wrapped in black plastic sheeting or other opaque covering, until the Superintendent directs that the sign shall be uncovered. | <i>Premature Sign Exposure</i> |

MATERIALS**C262.04 GENERAL**

- | | |
|--|--|
| 1. Details of the signs and sign support structures to be provided under the Contract shall be as shown on the Drawings. | <i>Details</i> |
| 2. The dimensions, legend and background for each sign shall be in accordance with this Specification and the Drawings. | <i>Dimensions Legend and Background</i> |

C262.05 SIGN BLANKS

- | | |
|--|--|
| 1. Sign blanks shall be 1.6 mm thick aluminium sheet alloy. The aluminium alloy shall be Type 5251 or Type 5052 and Temper H38 or Temper H36 in accordance with AS 1734. | <i>Aluminium Quality</i> |
| 2. Sign blanks shall be free of cracks, tears and other surface blemishes and the edges shall be true and smooth. The dimensions of the sign blank shall be within plus or minus 1.5 mm of the dimensions specified and the finished sign shall be flat within a maximum allowable bow of 0.5 per cent of the maximum dimension of the sign blank in any direction. | <i>Dimension Tolerances</i> |
| 3. Sign blanks shall be one piece except where the sign is of such a size as to require more than one full sheet of aluminium in which case a multi-piece sign shall be allowed. | <i>One Piece</i> |
| 4. A multi-piece sign shall be made up of the minimum number of pieces practical and sheets of the multi-piece sign shall be butted together with a maximum gap of 1 mm at any point along the joint. | <i>Multi-piece Sign</i> |
| 5. All joints shall be covered by a backing strip. The backing strip shall be riveted to each sheet with rivets, coloured to match the background material on the face of the sign, at a spacing not exceeding 200 mm. Backing strips shall be of the same material and colour as used for the sign blank and shall have a minimum width of 50 mm over the full length of the joint. | <i>Joint Backing Strips</i> |
| 6. The aluminium extrusion used for mounting may be used as the backing strip for horizontal joints where it complies with the spacing requirements. | <i>Aluminium Extrusion as Backing Strip</i> |

7. The face of each sign blank shall be chemically cleaned and etched or mechanically abraded. Where the sign blank is to receive a paint background, the face shall be spray painted with a compatible etch primer. **Face Treatment**

8. The back of each sign blank shall be uncoated and the surface finish shall be rendered dull and non-reflective either by mechanical or chemical means and shall be free of scratches and blemishes. **Back Treatment**

9. Signs shall be supplied with square holes or aluminium extrusion backing for mounting purposes, at the centre spacings as shown on the Drawings. **Mounting**

C262.06 ALUMINIUM EXTRUSION BACKING

1. The signs shall include special aluminium extruded sections for mounting purposes. The aluminium shall be Type 6063-T5 in accordance with AS 1866. **Design Section**

2. The aluminium extrusion shall be fixed at the centre spacings as shown on the Drawings and shall be riveted to the sign blank with correctly coloured rivets at a spacing not exceeding 200mm. **Fixing**

C262.07 RETRO-REFLECTIVE MATERIAL FOR BACKGROUND AND LEGEND

1. The retro-reflective material shall be 'Scotchlite', 'Seibulite', 'Kiwalite' or approved equivalent. The background and legend material shall be compatible both in application and durability. **Brand Names**

2. Retro-reflective material shall conform in colour and class to the requirements of AS 1743 for Class 1, Class 2 and Class 2A materials. Unless shown otherwise on the Drawings, the material shall be Class 1. **Standard**

C262.08 NON-REFLECTIVE BACKGROUND MATERIAL

(a) Background Paint **Quality**

1. Background paint shall be an approved long life industrial quality, two compound polyurethane paint. The paint shall exhibit high standards of adhesion, abrasion resistance, resistance to weathering and colour fastness under widely varying conditions of exposure. The paint shall be compatible with the etch primer used on the sign blank.

2. The paint shall be applied using conventional air spray application to give a uniform cover free of blemishes. A minimum dry film thickness of 38 microns is required when tested in accordance with AS 1580.108.2. **Application**

3. Background paint shall be as specified from one of the following colours: **Colours**

- (i) White - Gloss
- (ii) 'Dark' Green - Matt Colour No G61 as specified in AS 2700.
- (iii) 'Tourist' Brown - Matt Colour No X65, Dark Brown, as specified in AS 2700.
- (iv) 'Dark Grey' - Matt Colour No N64, Dark Grey as specified in AS2700.

4. Exact colorimetric values are set out in AS 2700. **Gloss Levels**
- (i) For matt coatings, the gloss level, determined by AS/NZS 1580.602.2, using an 85° head, shall be neither less than 12 per cent of gloss nor more than 15 per cent of gloss.
 - (ii) For gloss coatings, the gloss level, determined by AS/NZS 1580.602.2 using a 20° head shall be neither less than 85 per cent of gloss nor more than 95 per cent of gloss.

(b) Background Sheet Material

Quality

1. Adhesive cast vinyl sheet material such as 'Scotchcal' or other equivalent material may be used in place of background paint. The material shall be of uniform density and compatible with the material used for the legend both in application and durability.

2. The colours and gloss levels shall be uniform and conform to the requirements of Clause C262.08 (a).

Colours and Gloss

C262.09 NON-REFLECTIVE MATERIAL FOR LEGEND

(a) Legend Screening Ink

1. Screening ink shall be a high quality, full gloss, non-fade, non-bleed and scratch resistant type of ink compatible with the material to which it is applied. Screening ink shall have durability at least equal to the material to which the screening ink is applied.

Quality

(b) Legend Sheet Material

1. Adhesive cast vinyl sheet material such as 'Scotchcal' or other equivalent material approved by the Superintendent may be used in place of screening ink. The material shall be of uniform density and compatible with the material used for the background both in application and durability.

Quality

(c) Colours and Finish

1. The requirements of Clause C262.08 (a) shall also apply to non-reflective materials for legends but additional colours complying with AS 2700 may be specified.

Colours and Gloss

C262.10 RIVETS

1. Each rivet shall consist of a domed head and shank made of aluminium alloy and a steel mandrel which is discarded after securing the rivet.

Head and Shank

2. A paint coating shall be applied to the domed head so that when the rivet is in position it will show the same colour as the material to which it is attached. Paint may cover the shank of the rivet, providing the coating thickness does not restrict the insertion of the shank into the standard drilled hole for that rivet.

Painted Head

3. The paint shall be an alkyd enamel, which shall be applied after an appropriate treatment of the shank of the rivet to ensure long lasting adhesion.

Paint Application

C262.11 REFERENCE MARKINGS

- | | | |
|----|---|----------------------------|
| 1. | All signs shall be clearly and permanently stamped or engraved with an identification coding. The coding shall appear in ciphers of height neither less than 6 mm nor more than 10 mm on the rear of the sign and shall be carried out in such a manner that the front face of the sign is not damaged. | Identification Code |
| 2. | For rectangular signs, the coding shall appear as near as practicable to the bottom rear left hand corner. For other shaped signs, the coding shall be positioned on or below the horizontal centre line and as near as practicable to the left hand rear edge. | Location |
| 3. | Manufacturers shall include coding information in the following format:- Manufacturer's Name Month and Year of Manufacture Manufacturer and Class of Retro-Reflective Material | Information Shown |

C262.12 SIGN SUPPORT STRUCTURES**(a) General**

- | | | |
|----|--|-------------------------|
| 1. | Sign support structures shall be fabricated from steel sections which shall comply with the requirements of AS 1163, AS 3678 and AS 3679.1. | Standards |
| 2. | Signs support structures shall be standard round galvanised posts of 50, 65 or 80 mm nominal bore or purpose-designed steel structures as shown on the Drawings and manufactured in accordance with the requirements of AS 1250. | Size |
| 3. | Splices in members shall be restricted to a maximum of one splice per member. Splices shall be full penetration butt welds. | Splices |
| 4. | All welding shall be as shown on the Drawings and in accordance with the requirements of AS 1554.1, Category GP. | Welding Standard |

(b) Protective Treatment

- | | | |
|----|---|----------------------------|
| 1. | Except for standard galvanised posts, all steel components including brackets shall be protected by hot-dip galvanising after all fabrication processes are completed. | Hot-Dip Galvanising |
| 2. | The steel components shall be finished by the hot-dip galvanising process in accordance with AS 1650 to provide a minimum thickness of 100 microns and a bright finished surface free from white rust and stains. | Finish |
| 3. | Bolts, nuts and washers and brackets shall be galvanised in accordance with AS 1214. | Bolts, Nuts etc. |
| 4. | Splices in standard galvanised posts shall be painted by using a zinc-rich paint in accordance with Appendix G of AS 1650 to provide a zinc-rich coating at least equal to the thickness specified for the galvanised layer. | Splices |
| 5. | Scratched and slightly damaged surfaces of galvanised coatings shall be renovated by using a zinc-rich paint in accordance with Appendix G of AS 1650 to provide a zinc-rich coating at least equal to the thickness specified for the galvanised layer. This method of renovation shall be restricted to areas not exceeding 2500 square millimetres on any one structure. Any structure with totally-damaged coating areas exceeding 2500 square millimetres shall be regalvanised by the Contractor. | Damaged Surfaces |

(c) Attachment of Signs

1. Posts and other components shall be provided with the required sign attachment holes or fittings to suit the typical attachment systems as shown on the Drawings. Sign panels shall be attached to each supporting member at each extrusion section or bolthole in the sign panel.

Typical Systems**ERECTION OF NEW SIGNS****C262.13 SETTING OUT**

1. The location of signs shall be as shown on the Drawings. The Contractor shall set out the work to ensure that all signs and support structures are placed in accordance with the Drawings.

Location

2. Signs shall be aligned approximately at right angles to the direction of the traffic they are intended to serve. On curved alignments, the angle of placement should be determined by the course of approaching traffic rather than the orientation of the road at the point where the sign is located.

Alignment**C262.14 CLEARING**

1. Any trees and undergrowth within three metres of the sign support structure and along a motorist's line of sight to the front of the sign shall be cleared and removed.

Extent of Work**C262.15 SIGN STRUCTURE FOOTINGS**

1. The footings for a simple pipe support or the footings for each post of a purpose-designed sign support structure shall be constructed in accordance with the Drawings.

Details

2. The footings shall be neatly excavated to the depth and width shown on the Drawings. The material from the excavation shall be disposed of in a responsible and legal manner.

Excavation

3. When anchor bolt assemblies are specified they shall be accurately placed and firmly supported. Anchor bolt assemblies shall be provided with levelling nuts under the sign structure base plates to allow adjustment of the structure after installation.

Anchor Bolt Assemblies

4. Steel reinforcement shall be placed as shown on the Drawings.

Steel Reinforcement

5. Concrete in the footings of sign support structures shall comply with the Specification for MINOR CONCRETE WORKS C271 and have a minimum compressive strength at 28 days of 20MPa for pipe support footings and 32MPa for purpose-designed support footings.

Concrete Quality

6. If ready mixed concrete is used, the concrete shall be mixed and delivered in accordance with AS 1379.

Ready Mixed Concrete

C262.16 ERECTION

1. All components shall be accurately positioned and supported during erection. **Position and Support**
2. The top of each pipe support post shall extend sufficiently beyond the upper extrusion section or bolt holes on the sign panels to enable attachment of the signs. The top of each post shall be below the top edge of the sign panel. **Top of Post Level**
3. For pipe support multi-post installations, the tops of the posts shall be at the same level except where sign shape or the arrangement of sign panels dictates otherwise. **Multi-Post Installation**
4. During erection, sign panels shall be suitably supported and braced and the sign face protected from damage. Signs damaged during erection shall be repaired to a standard equivalent to the original sign or replaced by the Contractor. **Sign Damage**
5. Galvanised coatings on purpose-designed support structures which are scratched or slightly damaged during erection shall be renovated by using a zinc-rich paint in accordance with Appendix G of AS 1650 to provide a zinc-rich coating at least equal to the thickness specified for the galvanised layer. This method of renovation shall be restricted to areas not exceeding 2500 square millimetres on any one structure. Any structure with totally-damaged coating areas exceeding 2500 square millimetres shall be regalvanised. **Treatment of Damaged Areas**

ADJUSTMENT OF EXISTING SIGNS AND SUPPORT STRUCTURES**C262.17 GENERAL**

1. Where shown on the Drawings, the Contractor shall adjust existing sign panels and sign support structures. The work shall include minor adjustments of existing sign panels and/or sign support structures or the work may extend to the dismantling of signs and sign support structures, relocation or replacement of sign support structures including footings and re-erection of signs including all fittings. **Extent of Work**

SPECIAL REQUIREMENTS**C262.18 STREET NAME, SERVICE AND TOURIST SIGNS**

1. All street name, service and tourist signs shall comply with Local Government's adopted signage system and with the details as shown on the Drawings. **Signage System**
2. Proprietary signs shall be manufactured and installed in accordance with the requirements of Parts 1 and 6 of QMUTCD to the following details: **Proprietary Sign Requirements**

(SAMPLE ONLY - TO BE COMPLETED BY COMPILER)

 - a) Colour:
 - Legend - Blue, Non-reflective
 - Background - Yellow, Class 1 Retro-reflective
 - b) Lettering and Numerals:
 - Font Type - Series D
 - Height - 100mm

3. Details of Local Government's logo shall be supplied to the Contractor by the Local Government. **Logo**
4. Details of the signs and legends to be provided under the Contract shall be as shown on the Drawings. **Legends**

LIMITS AND TOLERANCES

C262.19 SUMMARY OF LIMITS AND TOLERANCES

1. The limits and tolerances applicable to the various clauses in this Specification are summarised in Table C262.19.1 below:

Table C262.19.1 - Summary of Limits and Tolerances

| Item | Activity | Limits/Tolerances | Spec Clause |
|------|---|-----------------------------|-------------|
| 1. | Sign Blanks | | |
| | (a) Dimensions | ± 1.50mm | C262.05 |
| | (b) Bow | < 0.5% of maximum dimension | C262.05 |
| | (c) Butt gap in multi-piece sign | < 1mm | C262.05 |
| | (d) Rivet spacing in backing strip | < 200mm | C262.05 |
| | (e) Backing strip width | >50mm | C262.05 |
| 2. | Extrusion Backing | | |
| | (a) Rivet Spacing | <200mm | C262.06 |
| 3. | Background Paint | | |
| | (a) For matt coatings, gloss level | >12% and <15% | C262.08 |
| | (b) For gloss coatings, gloss level | >85% and <95% | C262.08 |
| 4. | Reference Marking | | |
| | (a) Height of Coding | >6mm and <10mm | C262.11 |
| 5. | Sign Support Structures | | |
| | (a) Protective Treatment thickness | >100 microns | C262.12b |
| | (b) Paint coating over Splices in standard galvanised posts | >100 microns | C262.12b |
| | (c) Damaged Surface of galvanised surfaces: | | |
| | (i) Coating with zinc rich paint | Area <2500 sq. mm | C262.12b |
| | (ii) Regalvanise | Area >2500 sq. mm | C262.12b |

6. **Clearing**
(a) Trees and Undergrowth to be cleared <3 metres from sign support structure C262.14
7. **Concrete in Foundations of Sign Support Structures**
(a) Strength >25 MPa at 28 days C262.15

ANNEXURE

C262A QUALITY CONTROL AND TESTING

| ACTIVITY | KEY QUALITY VERIFICATION REQUIREMENTS | MAXIMUM LOT SIZE | MINIMUM TEST FREQUENCY | TEST METHOD |
|--|---|--|--|-------------|
| MANDATORY TESTING | | | | |
| Nil | | | | |
| AUDIT TESTING – IF ORDERED BY COUNCIL | | | | |
| Materials Supply | Material Quality - Supplier's documentary evidence and certification of: - Sign Blanks - Aluminium Extrusion Backing - Retro-reflective Material - Non-reflective Paint - Non-reflective Sheet Material - Steel Sign Support Structures | 1 contract 1 contract 1 contract 1 contract 1 contract 1 contract | 1 per contract, or change in material " " " " " | |
| Concrete Foundations | Refer 'Minor Concrete Works' | | | |