



Construction Specification for Civil Works

C262 - Signposting

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GENERAL

C262.01 SCOPE

This Specification is for the:

- (a) Supply and erection of the Regulatory, Warning, Guide, Information and Direction signs as described in AS 1742, AS 1743 and AS 1744;
- (b) Supply and erection of sign support structures to support the signs; and
- (c) Adjustment of existing signs and sign support structures.

Requirements for quality control and testing, including maximum lot sizes and minimum test frequencies, are cited in *CQC-Quality Control Requirements Sub-Annexure B10*.

Quality

C262.02 DEFINITIONS

The Works – Defined as follows:

The Works

- **Developer Infrastructure Works** - work includes subdivisions and any public infrastructure work associated with an approved Development in the TRC local government area requiring a construction certificate.
- **Contracted Works** – infrastructure work undertaken by a Principal Contractor or subcontractor formally appointed by TRC and supervised by TRC.
- **Internal Works** - infrastructure work undertaken by TRC's day labour workforce.

Constructor – Defined as the organisation responsible for construction of the Works and the Principal Contractor as defined in the *Work Health and Safety Act 2011*.

Constructor

TRC Representative – Defined as follows:

**TRC
Representative**

- **Developer Infrastructure Works** – Nominated TRC officer(s) for the approved Development.
- **For Contracted Works** – the Superintendent.
- **For Internal Works** – TRC Asset Owner

Constructor's Representative – Defined as follows:

**Constructor's
Representative**

- **Contracted Works** – the Principal Contractor's nominated representative as per the relevant contract.
- **Internal Works** – TRC officer responsible for delivery.

Developer's Representative– Defined as the person or organisation appointed by the Developer to administer the Constructor responsible for the delivery of **Developer Infrastructure Works**.

**Developer's
Representative**

C262.03 REFERENCE DOCUMENTS

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**

Where not otherwise specified in the relevant Tamworth Regional Council (TRC) Construction Specifications or the approved design drawings, the Constructor shall use the latest versions of the Reference documentation, including amendments and supplements, listed in the TRC Construction Specifications at the time of the Works approval.

Currency

(a) Tamworth Regional Council (TRC) Specifications

C201 - Control of Traffic.

C212 - Clearing and Grubbing

C271 - Minor Concrete Works.

CQC - Quality Control Requirements.

(b) Australian Standards

References in this Specification or on the approved design drawings to Australian Standards are noted by their prefix AS or AS/NZS.

- AS 1163 - Structural steel hollow sections.
- AS 1214 - Hot-dip galvanised coatings on threaded fasteners.
- AS 1250 - The use of steel in structures (SAA Steel Structures Code).
- 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 1734 - Aluminium and aluminium alloys - flat sheet, coiled sheet and plate.
- AS 1742 - Manual of uniform traffic control devices.
- AS 1743 - Road Signs – Specifications.
- AS 1744 - Forms of letters and numerals for road signs.
- 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.
- AS/NZS 4680 - Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.

(c) TRC Standard Drawings Applicable to this Section

G003 - Street Name Plate Details.

TRC Standard Drawings shall take precedence over ALL other drawings related to the Works.

Where any TRC Standard Drawings conflicts with this Specification, the requirements of this Specification shall take precedence. Proposals to deviate from this Specification shall constitute a **HOLD POINT**.

HOLD POINT

All proposed deviations from the approved design drawings, TRC Standard Drawings, this Specification or the documents referenced within it, shall be submitted for approval to the TRC Representative with supporting evidence at least five (5) working days prior to the work being undertaken.

PROCESS HELD: The lot or element affected by the proposed deviation.

HP
Hold Point

C262.04 PROVISION FOR TRAFFIC

The Constructor shall provide for traffic control in accordance *C201 - Control of Traffic* while undertaking the work and shall organise the work to avoid or minimise delays and inconvenience to traffic.

***Minimise
Inconvenience***

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 porous cloth sheeting or other opaque covering material.

***Premature Sign
Exposure***

MATERIALS

C262.05 GENERAL

The Constructor shall supply documentary evidence, satisfactory to the TRC Representative, that all materials and parts proposed for use comply with the requirements of the appropriate Australian Standard(s) and/or TRC Standard Drawing G003.

Proof of Quality

Details of the signs and sign support structures to be provided as part of the Works shall be as shown on the approved design drawings.

Details

The dimensions, legend and background for each sign shall be in accordance with this Specification and the approved design drawings.

*Dimensions
Legend and
Background*

C262.06 SIGN BLANKS

Sign blanks shall be 1.6mm 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.

*Aluminium
Quality*

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 1.5mm of the dimensions specified and the finished sign shall be flat within a maximum allowable bow of 0.5% of the maximum dimension of the sign blank in any direction.

*Dimension
Tolerances*

Sign blanks shall be one (1) piece except where the sign is of such a size as to require more than one full sheet of aluminium in which case a multipiece sign shall be allowed.

One Piece

A multipiece sign shall be made up of the minimum number of pieces practical and sheets of the multipiece sign shall be butted together with a maximum gap of 1mm at any point along the joint.

Multipiece Sign

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 200mm. Backing strips shall be of the same material and colour as used for the sign blank and shall have a minimum width of 50mm over the full length of the joint.

*Joint Backing
Strips*

The aluminium extrusion used for mounting may be used as the backing strip for horizontal joints where it complies with the spacing requirements.

*Aluminium
Extrusion as
Backing Strip*

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

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

Signs shall be supplied with square holes or aluminium extrusion backing for mounting purposes, at the centre spacings as shown on the approved design drawings.

Mounting

C262.07 ALUMINIUM EXTRUSION BACKING

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

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

Fixing

C262.08 RETROREFLECTIVE MATERIAL FOR BACKGROUND AND LEGEND

Retroreflective material shall conform in colour and class to the requirements of AS 1743 for Class 1, Class 2 and Class 2A materials.

Standard

C262.09 NON-REFLECTIVE BACKGROUND MATERIAL

(a) Background Paint

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.

Quality

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

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% of gloss nor more than 15% 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% of gloss nor more than 95% of gloss.

(b) Background Sheet Material

Adhesive cast vinyl sheet 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.

Quality

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

Colours and Gloss

C262.10 NON-REFLECTIVE MATERIAL FOR LEGEND

(a) Legend Screening Ink

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

Adhesive cast vinyl sheet material 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

The requirements of Clause C262.09(a) shall also apply to non-reflective materials for legends but additional colours complying with AS 2700 may be specified.

Colours and Gloss

C262.11 RIVETS

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

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.

Painted Head

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

C262.12 REFERENCE MARKINGS

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 6mm nor more than 10mm 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

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

Manufacturers shall include coding information in the following format:

Information Shown

- Manufacturer's Name.
- Month and Year of Manufacture.
- Manufacturer and Class of Retroreflective Material.

C262.13 SIGN SUPPORT STRUCTURES

(a) General

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

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 approved design drawings and manufactured in accordance with the requirements of AS 1250.

Size

Splices in members shall be restricted to a maximum of one splice per member. Splices shall be full penetration butt welds.

Splices

All welding shall be in accordance with the requirements of AS 1554.1, Category GP.

Welding Standard

(b) Protective Treatment

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

The steel components shall be finished by the hot-dip galvanising process in accordance with AS/NZS 4680 to provide an average minimum coating thickness of 85 microns and a bright finished surface free from white rust and stains.

Finish

Bolts, nuts and washers and brackets shall be galvanised in accordance with AS 1214.

Bolts, Nuts etc.

Splices in standard galvanised posts shall be painted by using an organic zinc-rich primer, or inorganic zinc silicate paint, in accordance with the repair requirements in Appendix E of AS/NZS 4680.

Splices

Scratched and slightly damaged surfaces of galvanised coatings shall be renovated by using an organic zinc-rich primer, or inorganic zinc silicate paint, in accordance with the repair requirements in Appendix E of AS/NZS 4680. This method of renovation shall be restricted to areas not exceeding 2500mm² on any one structure. Any structure with totally-damaged coating areas exceeding 2500mm² shall be regalvanised by the Constructor.

Damaged Surfaces

The cost of regalvanising such damaged coating areas shall be borne by the Constructor.

Constructor's Costs

(c) Attachment of Signs

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 approved design drawings. Sign panels shall be attached to each supporting member at each extrusion section or bolthole in the sign panel.

Typical Systems

The Constructor shall submit details of the proposed attachment systems for the approval of the TRC Representative and/or Developer's Representative (for Development Infrastructure Works) (refer Hold Point).

Constructor's Responsibility

ERECTION OF NEW SIGNS

C262.14 SETTING OUT

The proximity of the work zone to traffic shall be assessed. Where applicable Traffic Management Procedures shall be developed, installed and administered in accordance with *C201 - Control of Traffic*.

Traffic management

The location of signs shall be as shown on the approved design drawings. The Constructor shall set out the work to ensure that all signs and support structures are placed in accordance with the approved design drawings.

Location

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

The Constructor shall set out the proposed location and alignment of each sign support structure (refer Hold Point in Clause C262.16).

Constructor's Responsibility

Work on the foundations of the sign support structure shall not commence until the TRC Representative has inspected and approved the location and alignment of the sign support structure (refer Hold Point in Clause C262.16).

Approval of TRC Representative

C262.15 CLEARING

Any trees and undergrowth within three (3) metres of the sign support structure and along a driver's line of sight to the front of the sign shall be cleared and removed. The Constructor shall be responsible for assessing whether all approvals are in place for the removal of vegetation for this purpose. Vegetation removal shall be undertaken in accordance with *C212 - Clearing and Grubbing*.

Extent of Work

C262.16 SIGN STRUCTURE FOOTINGS

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 approved design drawings. In the absence of suitable detail in the approved design drawings, street name plates and other small signs shall be installed in accordance with TRC Standard Drawing G003.

Details

The use of Oz-Posts, or equivalent, shall be submitted for the consideration of the TRC Representative.

All relevant Dial Before You Dig (DBYD) checks and procedures shall be undertaken prior to excavation for the installation of sign support structures. It is the Constructor's responsibility to adequately locate and protect all services and assets.

Protection of Services

The footings shall be neatly excavated to the depth and width shown on the approved design drawings. The material shall be disposed of at a licensed waste facility.

Excavation

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

Steel reinforcement shall be placed as shown on the approved design drawings.

Steel Reinforcement

Concrete in the footings of sign support structures shall comply with *C271 - Minor Concrete Works* and have a minimum compressive strength at 28 days of 20MPa for pipe support footings and 32MPa for purpose-designed support footings. Reinforcement shall be installed in accordance with the approved design drawings.

Concrete Quality

HOLD POINT	
The following details shall be submitted to the TRC Representative and/or Developer's Representative (for Development Infrastructure Works) at least five (5) working days prior to the proposed installation of signage:	HP
<ul style="list-style-type: none"> • Sign supplier and the proposed sign type. • Details associated with the Sign support structures where applicable. • Traffic management arrangements, where applicable. • Sign set out. 	Hold Point
PROCESS HELD: Excavation of Footings and Erection of Signs.	

C262.17 ERECTION

All components shall be accurately positioned and supported during erection.

Position and Support

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

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

During erection, sign panels shall be suitably supported and braced and the sign face protected from damage.

Sign Damage

Signs damaged during erection shall be repaired to a standard equivalent to the original sign or replaced by the Constructor at the Constructor's cost.

Constructor's Cost

Galvanised coatings on purpose-designed support structures which are scratched or slightly damaged during erection shall be renovated by using an organic zinc-rich primer, or inorganic zinc silicate paint, in accordance with the repair requirements in Appendix E of AS/NZS 4680. This method of renovation shall be restricted to areas not exceeding 2500mm² on any one (1) structure. Any structure with totally-damaged coating areas exceeding 2500mm² shall be regalvanised.

Treatment of Damaged Areas

The cost of regalvanising such damaged coating areas shall be borne by the Constructor.

Constructor's Costs

ADJUSTMENT OF EXISTING SIGNS AND SUPPORT STRUCTURES

C262.18 GENERAL

Where shown on the approved design drawings and where directed by the TRC Representative, the Constructor 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

Where signs are removed, the impact of the removal of the sign shall be considered and addressed in the traffic management arrangements applicable to the Works site.

SPECIAL REQUIREMENTS

C262.19 STREET AND COMMUNITY FACILITY NAME SIGNS

All street and community facility name signs shall comply with TRC's adopted signage system and with the details as shown on the approved design drawings. Street name plates shall be in accordance with TRC Standard Drawing G003.

Signage System

Proprietary signs shall be manufactured and installed in accordance with the requirements of AS 1742.5.

Proprietary Sign Requirements

LIMITS AND TOLERANCES

C262.19 SUMMARY OF LIMITS AND TOLERANCES

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

Item	Activity	Limits/Tolerances	Spec Clause
1	Sign Blanks		
	(a) Dimensions	± 1.50mm	C262.06
	(b) Bow	< 0.5% of maximum dimension	C262.06
	(c) Butt gap in multipiece sign	< 1mm	C262.06
	(d) Rivet spacing in backing strip	< 200mm	C262.06
	(e) Backing strip width	> 50mm	C262.06
2	Extrusion Backing		
	(a) Rivet Spacing	< 200mm	C262.07
3	Background Paint		
	(a) For matt coatings, gloss level	> 12% and < 15%	C262.09
	(b) For gloss coatings, gloss level	> 85% and < 95%	C262.09
4	Reference Marking		
	(a) Height of Coding	> 6mm and < 10mm	C262.12
5	Sign Support Structures		
	(a) Protective Treatment thickness	> 85 microns	C262.13b
	(b) Paint coating over Splices in standard galvanised posts	> 85 microns	C262.13b
	(c) Damaged Surface of galvanised surfaces:		
	(i) Coating with zinc rich paint	Area < 2500mm ²	C262.13b
	(ii) Regalvanise	Area > 2500mm ²	C262.13b
6	Clearing		
	(a) Trees and Undergrowth to be cleared	< 3m from sign support structure	C262.15
7	Concrete in Foundations of Sign Support Structures		
	(a) Strength (pipe support footings)	> 25 MPa at 28 days	C262.16
	(b) Strength (purpose-designed support footings)	> 32 MPa at 28 days	C262.16

Table C262.1 - Summary of Limits and Tolerances

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