AUSTROADS TECHNICAL SPECIFICATION ATS 4320

Installation of Road Signs

Austroads

Contents

1. Scope

1.1 Austroads Technical Specification ATS 4320 sets out the requirements for the installation of signs on the road network. It also covers the removal, modification and relocation of existing signs.

1.2 ATS 4320 does not cover any of the following:

a) manufacture and supply of Sign Faces (refer to ATS 4310);

b) installation of signs attached to bridges, cantilever structures or gantries;

c) design of the Sign Supports;

d) installation of electronic message signs; or

e) installation of signs for temporary Works (unless specified otherwise).

1.3 The Contractor must install the Sign Supports and Sign Faces in accordance with:

a) the Design Documentation;

b) this Specification; and

c) AS 1742.2.

In the event of any ambiguity or inconsistency, the above order of precedence applies.

2. Referenced Documents

2.1 The following documents are referenced in this Specification:

Australian/New Zealand Standards	
AS/NZS 1163	Cold-formed structural steel hollow sections
AS 1397	Continuous hot-dip metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 1450	Steel tubes for mechanical purposes
AS 1742.2	Manual of uniform traffic control devices, Part 2: Traffic control devices for general use
AS 1866	Aluminium and aluminium alloys – Extruded rod, bar, solid and hollow shapes
AS 1906.1	Retroreflective materials and devices for road traffic control purposes, Part 1: Retroreflective sheeting
AS/NZS 3678	Structural steel – Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel, Part 1: Hot-rolled bars and sections
AS/NZS 4680	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
AS/NZS 4792	Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialized process
AS/NZS ISO 9001	Quality management systems – Requirements
Austroads	
ATS 1330	Management of Utilities on Site
ATS 4310	Supply of Road Signs
ATS 5316	Cementitious Mortars and Grouts
ATS 5335	Normal Class Concrete
ATS 5410	Structural Steelwork – Fabrication and Erection
ATS 5420	Supply of Steel Fasteners
ATS 5430	Fabrication of Aluminium Components
ATS 5450	Protection of Steelwork by the Use of Paint Coatings
ASTM International	
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes

3. Definitions

3.1 The definitions/abbreviations listed below and the definitions, abbreviations and terminology in AS 1743 apply to this Specification:

Design Documentation: Drawings, schedules and other documentation, designated as such, setting out the requirements for the manufacture and/or installation of the signs.

Sign Face: The part of a sign that comprises of the substrate, face material (retroreflective sheeting and/or coatings) and attached stiffeners.

Sign Support: A structure with the primary function of supporting the Sign Face, including rigid poles, frangible poles (impact absorbing and slip base), hinged poles and proprietary supports.

CHS: Circular Hollow Section.

RHS: Rectangular Hollow Section.

4. Quality System Requirements

4.1 The Contractor must prepare and implement a Quality Plan that includes the documentation in Table 4.1:

Table 4.1: Quality Plan

Clause	Description of document
6.1	Procedure and/or Inspection and Test Plans for installation of the Sign Supports
8.1	Procedure and/or Inspection and Test Plans for attachment of the Sign Faces

HOLD POINT 1	
Process Held	Commencement of sign installation
Submission Details	The Quality Plan must be submitted to the Principal at least 10 working days prior to the commencement of sign installation.

5. Materials

General

5.1 Sign Faces must comply with ATS 4310.

5.2 Where applicable to the sign being installed, steel and aluminium must comply with the standards set out in Table 5.2.

Table 5.2: Standards for steel and aluminium

Application	Standard	Minimum grade (1)
CHS posts	AS/NZS 1163	250 MPa
RHS posts	AS/NZS 1163 or AS 1450	250 MPa
Mid steel plate for base plates	AS/NZS 3678	350 MPa
Universal beams	AS/NZS 3679.1	300 MPa
Galvanised steel strip	AS 1397	250 MPa
Fluted aluminium poles and sleeves	AS 1866	6061-T6
Lattice type sign mast	AS 1866	6063-T6

Note:

1. A higher strength or grade may be specified in the Design Documentation.

5.3 The mill suppling the steel or aluminium components must operate under a quality management system complying with AS/NZS ISO 9001. This quality management system must be certified by a body accredited for that purpose under the criteria defined in the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or another member of the International Accreditation Forum (IAF).

5.4 Bolts, washers and nuts must comply with ATS 5420.

5.5 Concrete used in footings must comply with ATS 5335. Unless specified otherwise in the Design Documentation or manufacturer's instructions, the minimum concrete grade is N20 for unreinforced concrete and grade N32 for reinforced concrete. For unreinforced concrete footings, the Contractor may submit a proposal to the Principal to use a proprietary bagged product.

Fabrication of Steel and Aluminium Components

5.6 If fabricated Sign Supports will be installed, the fabrication of steel and aluminium components must comply with ATS 5410 and ATS 5430 respectively.

5.7 Poles must not be spliced unless approved by the Principal. The proposal submitted to the Principal for splicing of the poles must include details of the splice and evidence that the splice will achieve the design life of the pole.

5.8 Sign Supports must be saw cut and not sheared. Holes must be drilled or punched. The process of cutting, drilling or punching must not damage or deform a Sign Support.

5.9 Holes in Sign Supports must not be drilled outside of a workshop, unless unavoidable. If it is required to drill a hole outside of a workshop, prior to attaching the Sign Face, a suitable galvanising paint must be applied to the ungalvanised surface in accordance with the manufacturer's instructions.

5.10 Holes in Sign Supports must be located within ±1.0 mm of the specified position. The diameter of a drilled hole must be within ±1.0 mm of the specified diameter.

Protective Treatment of Steel

5.11 Fasteners, braces, clamps and other fittings used to attach the sign must be hot dip galvanised to at least 125 g/m^2 in accordance with AS/NZS 4680 or be manufactured from Grade 316 stainless steel complying with ASTM A276.

5.12 Steel posts and components must be either:

a) Hot dip galvanised in accordance with AS/NZS 4680;

b) pre-galvanised in accordance with AS/NZS 4792 class ZB135/135 (where permitted in the Design Documentation); or

c) pre-galvanised prior to fabrication to Class Z275 or ZM275 coating in accordance with AS 1397.

5.13 Where pre-galvanised steel is welded, a sprayed metal coating using a suitable zinc or zinc-alloy wire/powder must be applied to the weld seam in accordance with AS/NZS 4792, Section 3, to achieve a total minimum coating mass on both surfaces of 275 g/m^2.

5.14 Hot dip galvanising must be carried out after fabrication has been completed. The finish of galvanised steel must provide a bright finished surface free from white rust and stains.

5.15 Scratched and slightly damaged surfaces of galvanised coatings may be repaired using a zinc-rich paint in accordance with Clause 8 of AS/NZS 4680 to provide a zinc-rich coating at least equal to the thickness specified for the galvanizing layer, provided that if the total area affected does not exceed 2,500 mm^2. If the sum total area of damaged coating exceeds 2,500 mm^2, the entire steel post must be re-galvanised or replaced.

5.16 If a coloured finish for a post is specified in the Design Documentation, a protective duplex coating must be applied in accordance with ATS 5450.

Proprietary Products

5.17 A proprietary product, where used, must be a product approved by the Principal. The design life of a proprietary product must not be less 50 years. Proprietary products that may be considered by the Principal include frangible Sign Supports, footing spikes, sign attachment fittings and bagged pre-mixed cementitious products. A proprietary product must be installed in accordance with the manufacturer's instructions.

5.18 If the Contractor proposes to use a proprietary product that has not been previously approved or registered by the Principal, the Contractor must submit full details of the proposed product, including test results and/or other evidence of its suitability to the Principal.

HOLD POINT 2 (WHERE APPLICABLE)	
Process Held	Approval of a proprietary product
Submission Details	An application for approval of a proprietary product, including all test results and evidence of conformity, must be submitted to the Principal at least 20 working days prior to the proposed use of the proprietary product.

Identification of Sign Supports

5.19 Sign Supports must be clearly marked with the supplier/manufacturer's name, grade, and any other information specified in the applicable Design Documentation. The markings must:

a) be applied after the application of any surface coating to the sign support;

a) consist of either indelible lettering or a durable, graffiti resistant, UV stable sticker; and

b) be visible once the sign support has been installed.

Records

5.20 The Contractor must maintain records evidencing compliance with this Clause 5 and include the records in the Conformance Report (refer to Clause 9.1). If requested, the records must be submitted to the Principal prior to the installation of the signs.

6. General

6.1 The Quality Plan must include procedures and/or Inspection and Test Plans that address:

a) the methodology for verifying that there are no obstructions where the Sign Supports will be constructed;

b) the methodology for installing the Sign Supports;

c) where a concrete footing is used, the grade of concrete and the minimum time to elapse between placing the concrete and attaching the Sign Face;

d) where Sign Support includes a fabricated baseplate, the methodology for placing grout under the baseplate; and

e) cleaning of the Sign Face after installation (if necessary).

6.2 The transportation, storage, handling and installation of Sign Supports and Sign Faces must:

a) be undertaken in accordance with the manufacturer's instructions (where applicable);

b) not cause damage to the Sign Supports or Sign Faces; and

c) not void the manufacturer's warranty.

6.3 Where shown on the Design Documentation or if directed by the Principal, an existing sign must be modified, relocated or removed. Where a sign is to be modified or relocated, the Contractor must not damage the sign.

6.4 Where a sign is to be removed and not reinstalled within the Site, it becomes the property of the Contractor and must be removed from the Site, unless it is specified that the Principal will take possession of that sign.

6.5 Any holes remaining after removal of a post must be backfilled with granular material or material similar to the surrounding ground. The material must be suitably compacted up to the level of the adjoining surface.

7. Installation of Sign Supports

Position of Signs

7.1 The position and orientation of the signs must comply with the Design Documentation. If the position and orientation is not specified in the Design Documentation, the position and orientation must comply with Appendix D of AS 1742.2.

7.2 Prior to commencing installation, the Contractor must verify that there are no obstructions (such as a Utility) at the location where the footing for the Sign Supports will be constructed. The Contractor must notify the Principal if any previously unknown obstruction is detected prior to, or during, construction of the footing. If a Utility is present at the installation location, the requirements of ATS 1330 will apply.

7.3 The Contractor may submit a proposal to the Principal to make an adjustment to the position of the sign to avoid an obstruction, but the Principal is under no obligation to accept any such proposal.

7.4 Prior to commencing installation, the Contractor must verify that road users will have an unobstructed view of the Sign Face. If the Sign Face will be partially or fully obscured, the Principal must be promptly notified. The Contractor must not trim or remove vegetation without the Principal's prior approval.

WITNESS POINT 1	
Process	Commencement of sign installation
Notification	At least 3 working days prior to the commencement of sign installation.

Footings

7.5 Unless the Design Documentation permits the use of compacted granular backfill or cement treated backfill, footings must be constructed from concrete that has been placed in accordance with ATS 5335 and been compacted for the full depth of the footing. The use of high early strength concrete is subject to the Principal's prior approval.

7.6 The centre of the excavation for the footing must coincide with the centre of the Sign Support. If the excavated material cannot be utilised in the Works, it must be removed from the Site and disposed of in accordance with the applicable environmental management requirements.

7.7 Prior to the concrete pour, all foreign material must be removed from the excavation and the reinforcing steel must free of dirt, grease and other contaminants.

7.8 Where concrete footings are used, a Sign Face must not be attached to a Sign Support until the concrete has gained sufficient strength to support the sign without being damaged.

7.9 The finished surface of a concrete footing must be shaped to ensure free drainage of water away from the base. In an unpaved area, the surface level of the concrete must be between 50 mm and 100 mm above the surrounding ground surface when measured at the base of the Sign Support.

7.10 Where the Sign Support includes a fabricated baseplate that is mounted onto holding down bolts, the void between the underside of the baseplate and the top of the concrete footing must be filled with shrinkage compensated grout that complies with ATS 5316. Following installation of the Support Structure, at least 2 threads of each holding down bolt must project above the top of the nut.

7.11 Where sound concrete of a suitable strength is present at the location where a sign is to be installed (such as where a box culvert or concrete barrier is present), subject to the Principal's prior approval, a galvanised post mounting bracket may be bolted to the surface to attach the Sign Support. Any such mounting bracket must be a product approved by the Principal.

Footing Sleeves and Spikes

7.12 Footing sleeves (alternatively referred to as 'sockets') and 'spikes', which enable the rapid removal and/or replacement of CHS Sign Supports, must be used where specified in the Design Documentation.

7.13 Sleeves and spikes must be installed in accordance with the manufacturer's instructions and the Design Documentation. If nothing is specified, the nominal sleeve diameter must be approximately 15 mm larger than the nominal CHS diameter and the sleeve must protrude between 50 to 90 mm above an earth surface or 25 mm above a paved surface. The CHS must penetrate at least 450 mm into the sleeve and be securely fixed into the socket by an approved vandal-proof method.

7.14 If an aluminium sleeve is to be cast into concrete, it must be protected by the application of a suitable bituminous primer and completely wrapped in heavy duty bituminous tape. The treatment must be applied prior to transportation of the sleeve to the installation location.

Erection of Sign Supports

7.15 If the size, type and number of Sign Supports are not specified in the Design Documentation, the Sign Supports must comply with Appendix D.4 of AS 1742.2.

7.16 After installation of the Sign Face, the Sign Support must be straight, free of bends and not deviate from vertical by more than 1 in 100.

7.17 Where the Sign Support comprises of an open-ended section (such as a CHS), a galvanised end cap must be fitted to the top of the Sign Support to prevent the ingress of water.

8. Attachment of Sign Faces

General

8.1 The Quality Plan must include a procedure and/or Inspection and Test Plans to:

a) verify that, prior to installation, the message on the Sign Face (including spelling, shape, size, layout and colours) conforms to the Design Documentation;

b) ensure that the Sign Face is correctly installed and is not damaged during installation;

c) verify that the Sign Face complies with the specified vertical clearance; and

d) verify that once installed, the sign has not been damaged and the Sign Face is free of oil, grease or dirt.

8.2 Signs may only be attached other road furniture (such as utility poles, rigid lighting columns and traffic signal poles) if shown on the design Documentation. Where permitted, galvanised steel or stainless steel stramps or proprietary fittings that do not damage the pole must be used. Drilling of any existing pole to attach a sign is not permitted. Following installation, the Contractor must verify that the attachment has sufficient rigidity to prevent the Sign Face being affected by wind vibration.

8.3 Unless specified otherwise in the Design Documentation, Sign Faces must not be attached to frangible lighting poles (i.e. impact absorbing or slip base poles).

8.4 The handling and storage of the Sign Faces on Site must be undertaken in accordance with ATS 4310.

8.5 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:

a) the uphill corner of the sign is a minimum of 800 mm above the ground; and

b) the sign at the longer post is 2,200 mm minimum above the ground.

8.6 Fittings for attaching the sign must comply with the Design Documentation so that the Sign Face is securely connected to the Sign Support.

8.7 Unless specified otherwise on the Design Documentation:

a) Signs mounted on single posts must be positioned symmetrically.

b) Where the sign comprises 2 or more Sign Faces above each other, the individual Sign Faces must be mounted with the adjacent edges touching.

8.8 Following attachment to the Sign Support, the sign face must present an even surface that is free from twists, cracks, indentations or any other faults.

Tolerances

8.9 The top edge of each installed Sign Face must:

a) be horizontal, when assessed by a spirit level (for signs with a width ≤ 2.4 m); or

b) have a deviation ≤ 1 in 100 from horizontal, when assessed by a laser level (for signs with a width > 2.4 m).

8.10 Signs Faces must be installed within ±40 mm of the specified height, measured from the bottom of the sign or sign assembly to the lip of the kerb or edge of shoulder nearest the sign.

8.11 Sign Supports must be installed within ±100 mm of the specified horizontal location.

Masking of Signs

8.12 When erecting a new sign, or when removing, modifying and relocating an existing sign, at all times the message conveyed by the sign must be consistent with the intended traffic arrangement and the approved Traffic Management Plan. On new Works, the signs must be installed prior to traffic using the new configuration.

8.13 If a sign is erected before it becomes operational, it must be completely obscured by temporary masking. The temporary masking must not damage the sign and must not void the sign warranty. The period that a sign is masked must be kept to the minimum practicable.

8.14 Unless approved otherwise by the Principal, the material used to mask the sign must be hessian cloth with sufficient opacity to prevent the reflective face of the sign showing through at night. Paper or plastic must not be used to mask the sign.

8.15 Material that may abrade the sign surface must not be used to hold the hessian in place. Adhesive material must not be attached to either the front or rear face of the sign.

Cleaning

8.16 The installed Sign Face must be free of oil, grease, dirt or other deleterious material. If cleaning is required, a detergent-type, non-abrasive cleaner suitable for high quality paint surfaces must be used. The cleaner must also be free of strong aromatic solvents or alcohols and be chemically neutral (that is, pH of around 7.0). Stiff-bristle brushes or high-pressure sprayers must not be used. Following use of any cleaning agent, the sign surface must be thoroughly and immediately rinsed with clean water.

9. Completion

Conformance Report

9.1 The Contractor must prepare a Conformance Report that includes complete records of the sign manufacture and installation and submit the report to the Principal. The report must include:

a) The following records that are required under ATS 4310:

i) certification from the manufacturer of the retroreflective sheeting that the sheeting complies with AS 1906.1;

ii) certification from the manufacturer of the Sign Faces that the Sign Faces comply with all requirements of ATS 4310;

iii) warranty from the sign manufacturer; and.

iv) warranty from the retro-reflective sheeting manufacturer.

b) The following records for the supply of the Sign Supports:

   i) certification that the steel and/or aluminium used in Sign Supports and fittings comply with the applicable standard listed in Table 5.2;

   ii) where requested by the Principal, test results supporting the above certification; and

   iii) if applicable, evidence that steel and aluminium components have been fabricated in accordance with ATS 5410 and ATS 5430 respectively.

c) The following records (where relevant) for each sign:

   i) road identification/road number;

   ii) location reference (for example, maintenance marker point, chainage or GPS coordinates);

   iii) offset from closest travel lane;

   iv) sign type;

   v) applicable drawing number(s);

   vi) date installed;

   vii) sign support type;

   viii) reflectivity test results;

   ix) evidence of compliant positioning in accordance with the Design Documentation, including vertical height (both minimum offset from natural surface level and maximum height); and

   x) a photograph or video of the installed sign.

9.2 If requested, the installation records required under Clause 9.1 c) must be submitted to the Principal within 10 working days of that sign being installed.

9.3 Submission of the Conformance Report for all signs installed under the Contract is a condition precedent for Practical Completion or Completion (as the case may be).

‘As-constructed’ Drawings

9.4 Where specified in the Contract documents or directed by the Principal, the sign details, location and other relevant information must be shown on the ‘as-constructed’ drawings.

Annexure A Summary of Hold Points, Witness Points and Records

The following is a summary of the Witness Points/Hold Points that apply to this specification and the Records that the Contractor must submit to the Principal to demonstrate compliance with this specification.

CLAUSE	HOLD POINT	WITNESS POINT	RECORD
4.1	1. Commencement of Sign installation		Quality Plan
5.18	2. Approval of a proprietary product (where applicable)		Application for approval
7.4		1. Commencement of sign installation	
9.1			Conformance report
9.4			'As-constructed' drawings (where required)

Amendment Record

Amendment no.	Clauses amended	Action	Date
1.0	New specification	New	April 2026

Key

Format	Change in format
Substitution	Old clause removed and replaced with new clause
New	Insertion of new clause
Removed	Old clauses removed