

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION R143

SIGNPOSTING

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REVISION REGISTER

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 1/Rev 2	Annexure R65/2	Retroreflective Sheeting table reformatted to 2 pages.	GM, CMS	03.02.92
Ed 1/Rev 3	Notice Global 1.2, 1.3 3.7	Notice added to the back of the cover page. New number format for Clause numbers and lists. Reference to signs and Marking Manual modified. Clause on Sample Signs has been deleted.	GM, CEC	07.10.94
Ed 1/Rev 4	5.1	Hold Point reworded. 1st sentence reworded.	GM, CEC J Woodward	06.03.95
Ed 2/Rev 0		Specification Number changed from R65 to R143. Converted to MS Word 6.0c. References to RTA Specifications changed.	GM, PSP J Woodward	01.07.96
Ed 2/Rev 1	Revisions to Edition 2 1.2, 4.1 2.3	Amended clause. AS 1250 replaced by AS 4100. Reference to DR89052 deleted.	GM, RNIC J Woodward	18.02.97
Ed 3/Rev 0		Extensive revision RTA 3400 added as a reference	GM, RNIC	25.02.99
Ed 3/Rev 1	1.2 1.2, 3.2, 3.4, 4.4 Annexure R143/1	Minor changes AS 1650 replaced by AS/NZS 4680 New schedule listing Identified Records	GM, RNIC	30.08.99

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 4/Rev 0	Global 4.4 5.4 5.4	Text revised to direct imperative style. "Superintendent" replaced by "Principal". Reformatting and minor editing. "shall" replaced by "must". Clauses rearranged to fit the subject heading. Additional requirements for holding down bolts inserted Words "extruded sections" replaced by "stiffener rails". Requirement to submit for approval proposed method for filling void beneath baseplate inserted	GM, IC	23.10.08
Ed 4/Rev 1	1.1, 2, 3 Annexure R143/B	Clauses reworded. Pay Item R143P1 revised to include Class 1X and remove Class 2A.	GM, IC	11.02.11
Ed 4/Rev 2	5.3 Annex M	Concrete for foundation footings of purpose designed sign structures clarified to comply with RTA B80. Referenced documents updated.	GM, IC	16.06.11
Ed 4/Rev 3	Annex B	Scope of Pay Items R143P3, R143P4, R143P5 and R143P7 clarified to cover disposal of surplus excavated materials.	GM, IC	17.08.12
Ed 5/Rev 0	Global 1.1 1.2.4 2 2.3.1, 2.3.2	Clauses rearranged and reworded to improve clarity. Headings added to various clauses to form 2nd and 3rd tier sub-clauses. Terminology made consistent, distinguishing between "signs", "sign panels" and "sign support structures". Scope clarified. Standard clause for Planning Documents added. Subsequent clause renumbered. Previous clause 2 retitled. Individual clauses within previous Clause 2 rearranged. Cross reference to spec G10 for requirements of temporary signs deleted (scope for temporary signs covered in spec 3400). Previously clause 4.1, now divided into 2 sub-clauses 2.3.1 and 2.3.2. Previous clauses 4.2 to 4.4 now become clauses 2.3.3 to 2.3.5 respectively.	GM, CPS	24.03.15

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 5/Rev 0 (cont'd)	2.3.1	<p>“Standard galvanized round posts” now referred to as “circular hollow sections”, and specified to relevant Aust Stds.</p> <p>References to approved proprietary frangible post products and modular sign structures added.</p>		
	2.3.2	Requirement added to fabricate sign support structures in accordance with B200 and B204 where so nominated in Annex A.		
	2.3.3	Requirement to treat steel surfaces with abrasive blasting prior to galvanizing deleted (as such treatment is not required).		
	2.3.6	New sub-clause on holding down bolts, other bolts, washers and nuts, moved here from previous clause 5.3.		
	3.1	Previous clause 7, on provision for traffic, moved here. Previous clauses 5.1 to 5.5 now become clauses 3.2 to 3.6 respectively.		
	3.2	Previously clause 5.1. Figure 1 showing correct orientation of signs on straight and curved sections of road added.		
	3.3	Previous clause 5.2. Vegetation clearing requirements clarified.		
	3.4.1	Requirement to contact Dial Before You Dig and locate existing utilities prior to any excavation work, added.		
	3.4.3	Note added that Hold Point in referenced specs B80 and R53 for concrete placement applies.		
	3.5.1	Erection to be in accordance with AS 4100 added.		
	3.5.2	Bolt tightening requirements clarified.		
	3.5.5	New clause on provision of back tilt to vertical post for cantilever sign structures.		
	3.5.6	Requirement to cap top of galvanized steel post added.		
	Annex A	8th para in previous clause 5.4 (repeat of statement in clause 2.3.3) replaced by reference to clause 2.3.3.		
	Table inserted for tender documenter to nominate which sign support structures are to be fabricated in accordance with B200 and B204.			

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 5/Rev 0 (cont'd)	Annex B Annex B Annex D Annex M	Pay items changed. Cost of clearing, excavation and disposal of surplus excavated material is to be included in the rates Qualification added that no payment will be made for removal, modification and/or relocation of existing signs to suit the Contractor's traffic staging. Comments added on how to customise signposting pay items to cover different types of signs. Planning Documents added. Referenced Documents updated.		
Ed 5/Rev 1	2.3.2, Annex A & C2 Annex M	References to "B200 and B204" replaced by "B201". Referenced documents updated.	DCS	27.10.17
Ed 5/Rev 2	3.2 Annex M	Requirements for lateral clearance and mounting height of signs to comply with AS 1742.2 added. Referenced documents updated.	MCQ	21.05.20
Ed 5/Rev 3	Global	References to "Roads and Maritime Services" or "RMS" changed to "Transport for NSW" or "TfNSW" respectively.	DCS	22.06.20



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VERSION FOR: DATE:

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FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW R143 Edition 5 Revision 2.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

TfNSW QA SPECIFICATION R143

SIGNPOSTING

1 GENERAL

1.1 SCOPE

This Specification sets out the requirements for the supply and installation of road signs, including requirements for the support structures and associated footings. It also covers the removal, modification and relocation of existing signs.

The requirements for manufacture and supply of sign panels, including temporary signs for traffic management in road works, are covered in Specification TfNSW 3400.

1.2 STRUCTURE OF THE SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

1.2.1 Project Specific Requirements

Project specific requirements are shown in Annexure R143/A.

1.2.2 Measurement and Payment

The method of measurement and payment is detailed in Annexure R143/B.

1.2.3 Schedules of HOLD POINTS and Identified Records

The schedules in Annexure R143/C list the **HOLD POINTS** that must be observed. Refer to Specification TfNSW Q for the definition of **HOLD POINTS**.

The records listed in Annexure R143/C are **Identified Records** for the purposes of TfNSW Q Annexure Q/E.

1.2.4 Planning Documents

The PROJECT QUALITY PLAN must include each of the documents and requirements listed in Annexure R143/D and must be implemented.

1.2.5 Referenced Documents and Definitions

Unless specified otherwise, the applicable issue of a referenced document, other than a TfNSW specification, must be the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 1234). For convenience, the full titles are given in Annexure R143/M.

The terms “you” and “your” mean “the Contractor” and “the Contractor’s” respectively.

2 MANUFACTURE OF SIGNS

2.1 GENERAL

Details of the sign panel, support structure, footing, and quantity of each type of sign required under the Contract, are shown on the Drawings.

2.2 SIGN PANELS

2.2.1 General

Manufacture, handle, transport and store the sign panels in accordance with TfNSW 3400.

2.2.2 Dimensions, Legend and Background

The dimensions, legend and background for each sign panel must comply with the requirements of TfNSW 3400 and the Drawings.

2.2.3 Aluminium Sections for Wide Panels

For aluminium sign panels wider than 750 mm, attach aluminium sections (as stiffeners) at the back of the sign panel, of the type, size and location, in accordance with TfNSW 3400 and the Drawings.

2.3 SIGN SUPPORT STRUCTURES

2.3.1 General

Support structures for signs can be one of the following:

- (a) standard circular hollow sections (CHS), of grade C250L0 or C350L0 complying with AS/NZS 1163, and pre-galvanized in accordance with AS/NZS 4792;
- (b) approved proprietary frangible post products - a list of TfNSW approved proprietary frangible post products can be found at:
<http://www.rms.nsw.gov.au/business-industry/partners-suppliers/design-documents/frangible-products.html>;
- (c) modular sign structures, in accordance with Model Drawing CW 9746 Sheets 1 to 5;
- (d) purpose designed steel structures.

2.3.2 Fabrication

Fabricate the sign support structures so nominated in Annexure R143/A in accordance with Specifications TfNSW B201, and to the details shown on the Drawings.

Fabricate all other sign support structures in accordance with the requirements of AS 4100. All welding must be as shown on the Drawings and comply with the requirements of AS/NZS 1554.1, Category SP.

Restrict the number of splices in any member to a maximum of one splice per member. Splices must be full penetration butt welds.

2.3.3 Protective Treatment

Other than pre-galvanized CHS posts, provide a protective treatment to all steel components including brackets, by hot-dip galvanizing them in accordance with AS/NZS 4680 after fabrication.

Finish the steel components after galvanizing to provide a bright finished surface free from white rust and stains.

You may repair scratched and slightly damaged surfaces of galvanized coatings, if the total area affected does not exceed 2500 mm², 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.

If the sum total area of damaged coating exceeds 2500 mm², re-galvanize the structure at your own cost.

For pre-galvanized CHS posts, treat any field splices using a zinc-rich paint in accordance with Clause 8 of AS/NZS 4680.

Galvanize all bolts, nuts, washers and brackets in accordance with AS 1214.

2.3.4 Provision for Attachment

Provide posts and other components with the required sign attachment holes or fittings to suit the typical attachment systems as shown on the Drawings.

Submit details of your proposed attachment systems to the Principal for approval.

2.3.5 Transport and Storage

Transport and store galvanized sign support structures in accordance with the guidelines in Appendix F of AS/NZS 4680.

2.3.6 Holding Down Bolts, Other Bolts, Washers and Nuts

Holding down bolts, other bolts, washers and nuts for sign support structures must be as shown on the Drawings, and complying with Specification TfNSW B240.

3 ERECTION OF NEW SIGNS

3.1 TRAFFIC MANAGEMENT

Provide traffic management in accordance with the requirements of Specification TfNSW G10 when erecting signs. Plan the work to avoid or minimise delays and inconvenience to travelling public.

When erecting new signs, or when removing, modifying and relocating existing signs (refer Clause 4), the message conveyed by the signs must at all times be consistent with the intended traffic arrangement.

After a sign is erected but before it becomes operational, completely and securely wrap the face of the sign in hessian cloth until the sign is actually required. Do not use black plastic sheeting to cover the face of the sign.

3.2 SETTING OUT

Set out the signs, and their support structures and associated footings, to the positions shown on the Drawings, or as directed by the Principal.

Orientate the signs in the manner shown in Figure R143.1 on straight sections and curved sections of the road.

Comply with AS 1742.2 Appendix D, Clause D2.3 for the lateral locations of roadside signs and overhead sign structure supports, and for the mounting heights of roadside and overhead signs, unless shown otherwise on the Drawings.

HOLD POINT

Process Held: Construction of sign support structure foundations.

Submission Details: Proposed location and orientation of each sign support structure.

Release of Hold Point: The Principal will inspect the proposed sign locations, prior to authorising the release of the Hold Point.

3.3 VEGETATION CLEARING

Clear and remove any tree branches and undergrowth for a distance of 3 m from the front of the sign that can potentially obstruct the motorist's line of sight to the sign. Do not remove any existing trees without the prior approval of the Principal.

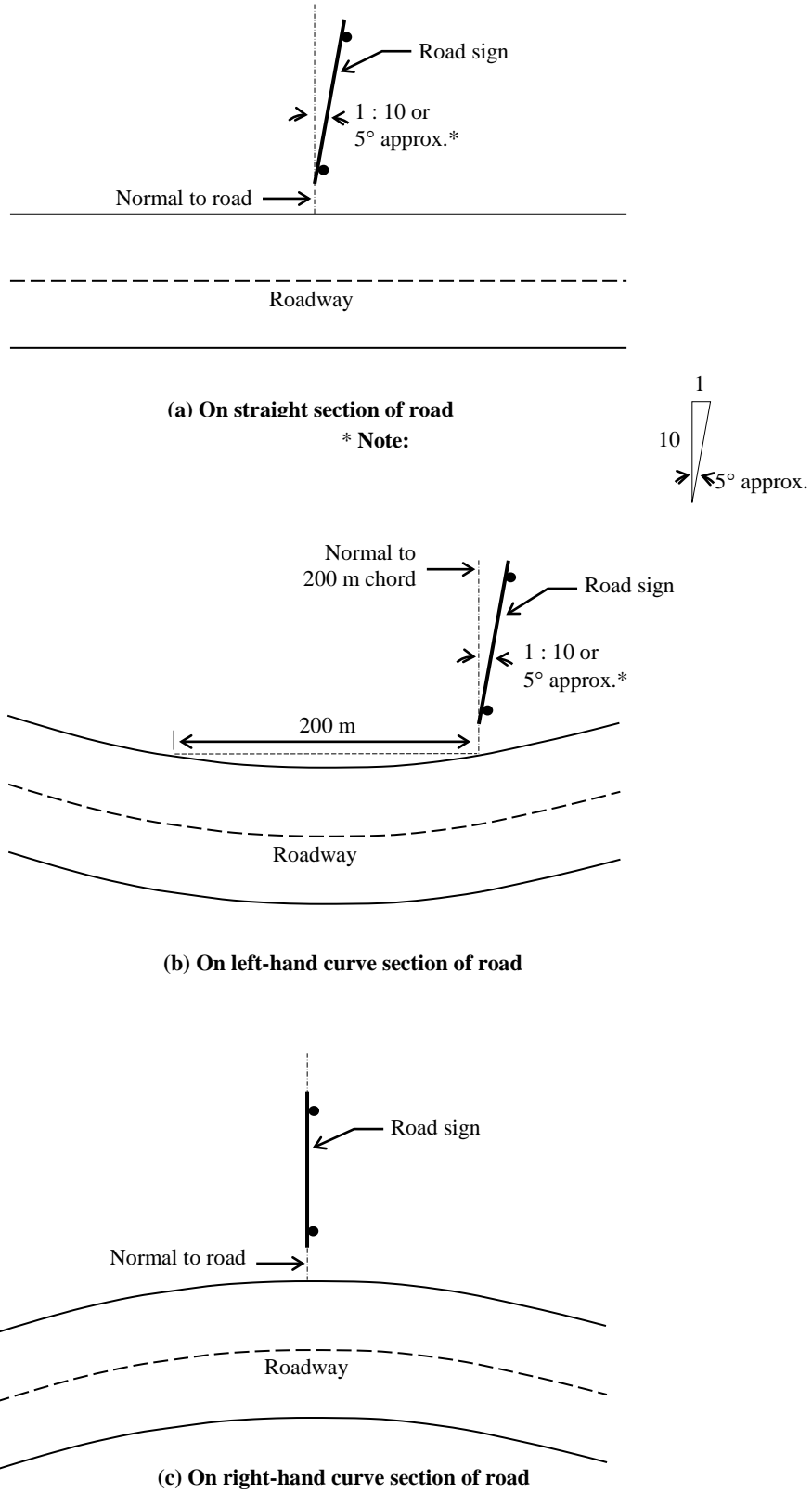


Figure R143.1 – Sign Orientation on Straight Sections and Curved Sections of Road

3.4 FOUNDATIONS

3.4.1 Existing Utilities

Prior commencing any excavation, contact Dial Before You Dig and obtain the plan locations of all existing utilities. Carry out investigations, including potholing or other non-destructive digging as may be necessary to locate and identify all existing utilities in the vicinity of the sign location(s).

Comply, insofar as is practicable, with the requirements of the “Model Agreement for Local Councils and Utility/Service Providers” and the “Guide to Codes and Practices for Streets Opening” published by the NSW Streets Opening Conference.

Where the sign support structure footing will encroach upon a space allocation, confer with the utility owner affected so that the proposed footing does not become an obstruction to existing utilities.

3.4.2 Excavation

Excavate for the sign support structure foundations at the locations and to the depth and width shown on the Drawings.

Dispose of any surplus excavated material by spreading it out neatly within the road reserve and compacting it lightly, unless directed otherwise by the Principal.

If the base or the sides of the excavation are composed of material which is not adequate for supporting the proposed structure, excavate and remove the material to the extent directed by the Principal. Replace the excavated material with materials acceptable to the Principal, and compact to at least the same relative compaction as the surrounding material.

3.4.3 Steel Reinforcement and Concrete

Place any steel reinforcement required as shown on the Drawings.

Place concrete to the details shown on the Drawings.

Concrete for footings of the sign support structures nominated in Annexure R143/A (refer Clause 2.3.2) must comply with Specification TfNSW B80. Concrete for all other footings must comply with Specification TfNSW R53.

The Hold Points in the respective specifications (B80 and R53) for placement of concrete apply.

3.4.4 Holding Down Bolts

Prior to placing concrete, accurately align the holding down bolts within the concrete footing to suit the sign structure baseplate. Set the bolts within the footing such that at least two threads will project above the top of the nut after installation of the support structure.

3.5 SIGN SUPPORT STRUCTURES ERECTION

3.5.1 General

Carry out erection of modular sign structures and purpose designed sign structures in accordance with AS 4100. Accurately position and support all components of the sign support structure during erection.

Tighten bolts to the requirements shown on the Drawings. For bolts specified as fully tensioned, you may use either the part-turn method or a direct-tensioning indication device, in accordance with AS 4100.

3.5.2 Back Tilt for Cantilever Sign Structures

When erecting sign support structures with a cantilever arm, provide a back tilt to the vertical post to compensate for any end sag of the cantilever arm, to the degree shown on the Drawings.

3.5.3 Connection of Baseplate to Footing

For modular sign structures and purpose designed sign structures with baseplates, provide levelling nuts under the baseplate to allow adjustment of the structure after installation.

Do not enlarge the baseplate holes or crank the bolts to correct any misalignment of the holding down bolts.

After erection of the sign support structure is complete and has been adjusted to its final position, completely fill the resulting void between the underside of the baseplate and the top of the concrete footing with non-shrink grout. Submit to the Principal for approval details of your proposed method of filling the void under the baseplate.

3.5.4 Height of Posts

Where sign panels are to be attached directly to posts, the top of each post must extend sufficiently above either the topmost stiffener rail (in the form of extruded aluminium sections) or bolt holes on the sign panels as applicable, to enable attachment of the signs.

The level of the top of each post must however be below the top edge of the sign panel.

In multi-post installations, the top of each post must all be at the same level.

3.5.5 Cap to Steel Posts

Cap the tops of galvanized steel posts to minimise the ingress of water and other matter which would prematurely corrode the post.

3.5.6 Damaged Galvanized Coatings

Repair or re-galvanize any damaged galvanized coatings of sign structures in accordance with Clause 2.3.3.

3.6 SIGN PANELS ERECTION

3.6.1 General

During erection, support and brace the sign panels and protect the sign face from damage.

3.6.2 Attachment of Sign Panels

Attach the sign panels to the support structure at each extruded aluminium section or bolt hole provided on the sign panel using the mounting hardware shown on the Drawings.

The mounting height of the sign panels must be as shown on the Drawings.

Where sign panels are to be attached to a horizontal arm, or to vertical members of the support structure, the positioning of these members must comply with the Drawings.

3.6.3 Damaged Sign Panels

Repair or replace at your own cost any sign panels damaged during erection to a standard equivalent to the original sign.

4 REMOVAL, MODIFICATION AND RELOCATION OF EXISTING SIGNS

Where shown on the Drawings or where directed by the Principal, carry out the removal, modification and/or relocation of existing signs.

Separate pay items are provided in Annexure R143/B for each type of existing sign removed, modified and/or relocated.

ANNEXURE R143/A – PROJECT SPECIFIC REQUIREMENTS

Refer Clause 2.3.2.

The following sign support structures must be fabricated in accordance with TfNSW B201, and concrete for their footings must comply with TfNSW B80.

Insert in the table below any sign support structures whose failure may have severe consequences. Examples of such structures include cantilever and overhead gantry type sign support structures.

Sign No	Location		Comments
	Road/Control Line	Chainage	

ANNEXURE R143/B – MEASUREMENT AND PAYMENT

Payment will be made for all costs associated with completing the work detailed in this Specification in accordance with the following Pay Items.

Where no specific pay items are provided for a particular item of work, the costs associated with that item of work are deemed to be included in the rates and prices generally for the Work Under the Contract.

Unless specified otherwise, a lump sum price for any of these items will not be accepted.

Payment for the cost of all work associated with traffic management required for the erection of signs will be made under the appropriate pay item(s) in TfNSW G10.

The cost of vegetation clearing, excavation for the support structure foundations, and disposal of any surplus excavated material, is to be included in the rates of the relevant pay items in this Specification.

The cost of covering and uncovering permanent signs is to be included in the rates for the relevant pay items in this Specification.

Pay Item R143P1 – Removal, Modification and Relocation of Existing Signs

The unit of measurement is “each” existing sign removed, modified or relocated as shown on the Drawings or directed by the Principal.

No payment will be made for removal, modification and/or relocation to temporary locations to suit your construction or traffic staging.

Pay Item R143P1.1 – Removal of Existing Signs

The rate includes all costs associated with the removal and disposal of existing signs, including their support structures.

Pay Item R143P1.2 – Relocation (Without Modification) of Existing Signs

The rate includes all costs associated with the relocation (but without modification) of existing signs, including construction of footings at the new locations.

Pay Item R143P1.3 – Modification and Relocation of Existing Signs

The rate includes all costs associated with the modification and relocation of existing signs, including construction of new footings at the new locations.

For each of the respective Pay Items R143P1.1, R143P1.2 and R143P1.3, itemise each sign type shown in the Drawings to be removed, modified and/or relocated under the Contract.

Example:

Pay Item R143P1.1 – Removal of Existing Signs

- (a) *Sign No: W6-3D*
- (b) *Sign No: W8-14C*

Pay Item R143P1.3 – Relocation (Without Modification) of Existing Signs

- (a) *Sign No: G1-1*
- (b) *Sign No: G4-1*
- (c) *Sign No: G5-1B*

Note: *Pay Items R143P1.1 to R143P1.3 do not cover work involving modification of existing signs but leaving them in the same location. If such work is included in the Contract, insert the following pay item:*

Pay Item R143P1.4 – Modification (Without Relocation) of Existing Signs

The rate includes all costs associated with the modification of existing signs, including any replacement sign panels and any new attachment brackets.

Pay Item R143P2 - Supply and Installation of New Signs

The unit of measurement is “each” new sign installed.

The rate includes all costs associated with the supply and installation of new signs, including foundations, support structures, any necessary protective treatment, and sign panels.

Pay Item R143P2.1 – New Signs with Standard CHS Post Support Structure

Pay Item R143P2.2 – New Signs with Modular Sign Support Structure

Pay Item R143P2.3 – New Signs with Purpose Designed Steel Support Structure

For each of the respective Pay Items R143P2.1, R143P2.2 and R143P2.3, itemise each sign type shown in the Drawings to be supplied and installed under the Contract.

Example:

Pay Item R143P2.1 – New Signs with Standard CHS Post Support Structure

- (a) *Sign No: R1-2*
- (b) *Sign No: R5-400*
- (c) *Sign No: W5-20*

Pay Item R143P2.3 – New Signs with Purpose Designed Steel Support Structure

- (a) *Sign No: G1-5*
- (b) *Sign No: GE1-12*

***Note:** Pay Items R143P2.1 to R143P2.3 do not cover work involving supply and installation of new signs with proprietary frangible posts as support structure. If such work is included in the Contract, insert the following pay item:*

Pay Item R143P2.4 – New Signs with Proprietary Frangible Post Support Structure

ANNEXURE R143/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

Refer to Clause 1.2.3.

C1 SCHEDULE OF HOLD POINTS

Clause	Description
3.2	Submission of proposed location and orientation of each sign support structure

C2 SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of TfNSW Q Annexure Q/E.

Clause	Description of Identified Record
2.3.2	For sign support structures fabricated in accordance with TfNSW B201, the Identified Records specified in these Specifications
2.3.4	Details of proposed sign panel attachment systems
3.2	Proposed location and orientation of each sign support structure

ANNEXURE R143/D – PLANNING DOCUMENTS

Refer to Clause 1.2.4.

The following documents are a summary of documents that must be included in the PROJECT QUALITY PLAN. The requirements of this Specification and others included in the Contract must be reviewed to determine additional documentation requirements.

Clause	Description
2.3.3	Method of repairing scratched and slightly damaged surfaces of galvanized coatings
3.5.1, 3.6.1	Method of supporting sign structure and sign panels during erection
3.5.3	Method of filling void between underside of baseplate and top of concrete footing

ANNEXURES R143/E TO R143/L – (NOT USED)

ANNEXURE R143/M – REFERENCED DOCUMENTS

Refer to Clause 1.2.5.

TfNSW Specifications

TfNSW G10	Traffic Management
TfNSW Q	Quality Management System
TfNSW R53	Concrete for General Works
TfNSW B80	Concrete Work for Bridges
TfNSW B201	Steelwork for Bridges
TfNSW B240	Steel Fasteners
TfNSW 3400	Manufacture and Delivery of Road Signs

Australian Standards

AS/NZS 1163	Cold-formed structural steel hollow sections
AS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1554.1	Structural steel welding – Welding of steel structures
AS 1742.2	Manual of uniform traffic control devices – Traffic control devices for general use
AS 4100	Steel structures
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 4792	Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or a specialized process