

Technical Note 174

Purchasing Guidelines for TMR Major Sign Structures

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1 Scope

This document applies to the design and installation of major signs or gantries and support structures, particularly Intelligent Transport Systems (ITS) structures as described in Section 10 of the *Design Criteria for Bridges and Other Structures* manual.

Typical examples of major ITS signs or gantries include but are not limited to the following:

Figure 1(a) – Single Post Cantilever Gantry

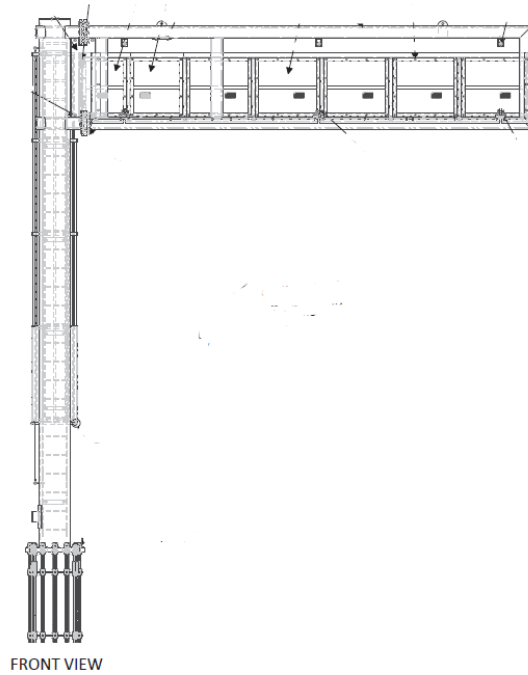
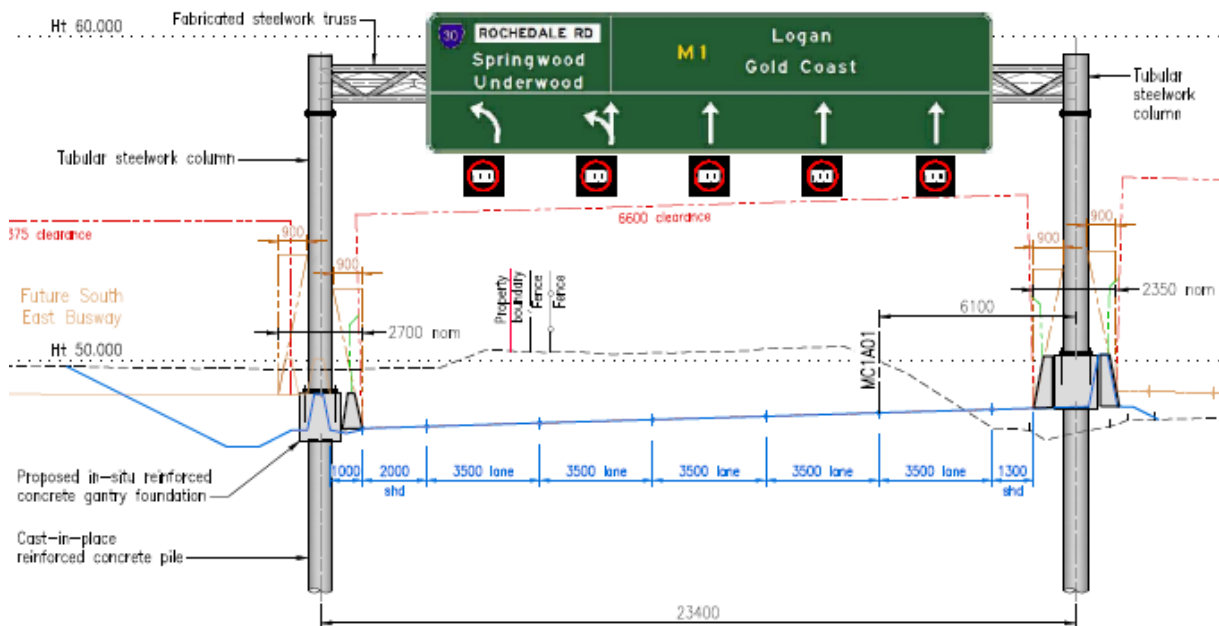


Figure 1(b) – Multi Post Gantry (Lightweight gantry shown - no walkway)



2 Contract Documents

When advertising a tender for the design and installation of a major sign or gantry the tender documents are to request compliance with the following documents where applicable.

Table 2 – Contract Documents

Reference	Title
-	<i>Design Criteria for Bridges and Other Structures</i>
MRTS01	<i>Introduction to Technical Specifications</i>
MRTS02	<i>Provision for Traffic</i>
MRTS04	<i>General Earthworks</i>
MRTS14	<i>Road Furniture</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS51	<i>Environmental Management</i>
MRTS61	<i>Mounting Structures for ITS Devices</i>
MRTS63A	<i>Piles for Ancillary Structures</i>
MRTS70	<i>Concrete</i>
MRTS71	<i>Reinforcing Steel</i>
MRTS78	<i>Fabrication of Structural Steelwork</i>
MRTS78A	<i>Fabrication of Structural Stainless Steelwork</i>
MRTS79	<i>Fabrication of Aluminium Components</i>
MRTS80	<i>Supply and Erection of Bridge Barrier</i>
MRTS91	<i>Conduits and Pits</i>
MRTS92	<i>Traffic Signal and Road Lighting Footings</i>
MRTS202	<i>Variable Message Signs</i>
MRTS206	<i>Provision of Variable Speed Limit and Lane Control Signs</i>

3 Reference Documents

The following Standard Drawings are also available for ITS Sign Gantries.

Table 3 – Standard Drawings

Standard Drawing Number	Title
SD1573	<i>ITS gantries - Lane control/Variable speed limit signs - Without maintenance platform</i>
SD1577	<i>ITS gantries - Lane control/Variable speed limit signs - Walk on gantry</i>
SD1581	<i>ITS - Cantilever - Cantilever structure</i>

These Standard Drawings capture some of the general parameters for ITS gantries. The relevant Standard Drawings may be considered for inclusion with tender documents to further inform the tender process.

Drafting and Design Presentation Standards Manual (DDPSM), Volume 3 Chapter 21 - *Major Sign Structures* provides a checklist for detailed design documentation.

4 Survey

The gantry structure site shall be surveyed to facilitate the accurate location of existing features including services, barriers including types and carriageway profiles to inform clearances to the proposed structures.

5 Geotechnical Investigation

The gantry structure site foundation shall be assessed by a pre-qualified Transport and Main Roads geotechnical engineer who will provide a geotechnical report for the project site. This report is to be used for designing the foundations and checks to ensure the foundation is appropriate for the ground conditions, to ensure it will be able to withstand the gantry design loads and will not be susceptible to unacceptable settlement effects.

6 Gantry Design

The gantry shall be designed in accordance with the requirements of the Technical Specifications and the *Design Criteria for Bridges and Other Structures*.

The design basis, calculations, design report and engineering drawings shall be certified by a Registered Professional Engineer Queensland (RPEQ). The design basis and subsequent design report shall both be submitted to the structures review and standards unit for review and acceptance.

Detailed engineering drawings shall be supplied for acceptance prior to fabrication. A check list for the drawing requirements may be located in Chapter 21 of the DDPSM.

Where walkways are provided for access, the design basis and engineering drawings shall clearly document the maximum ULS (Ultimate Limit State) and SLS (Serviceability Limit State) live loads that can be applied to the walkways and any restrictions on load patterns or intensity.

The design basis shall confirm the safety in design principles and provisions proposed for installation and maintenance and clearly identify the methods for access proposed and special provisions required for plant adjacent to the gantry.

The design report shall include fatigue life assessments and clarify measures incorporated to reduce fatigue sensitivity. This shall include assumptions and any installation requirements that are considered critical to achieving the fatigue criteria.

The provision for drawing cables and wiring shall be in accordance with the department's design criteria.

Section 10 of the *Design Criteria for Bridges and Other Structures* informs the design requirements of gantries. Gantries often require roadside barriers to manage safety of road users and protect the structure itself as defined in the *Design Criteria for Bridges and Other Structures*.

7 Fabrication

The gantry structure is to be fabricated by an approved registered fabricator in accordance with Section 10 of the *Design Criteria for Bridges and Other Structures* which also references MRTS78 *Fabrication of Structural Steelwork* and MRTS79 *Fabrication of Aluminium Components*.

8 Electrical

All electrical control enclosure doors when in an open position, shall not obstruct the walkways to less than 500 mm and 180°, door hinging may be necessary to achieve this requirement. The doors shall be designed suitably to be secured in the open position.

Where flat panels or components are able to be unscrewed, provision shall be provided to avoid screws and components from falling onto traffic below.

9 Electrical Installation

The gantry electrical components shall be erected in accordance with the engineering drawings.

10 Structural Installation

Structural erection shall be in accordance with MRTS80 *Supply and Erection of Bridge Barrier*, TN68 *VMS Gantry Installation Procedure* and as per Section 10 of the *Design Criteria for Bridges and Other Structures*.

TN67 *VMS Gantry Repair Procedure* is also informative for repairs which may be required for new installations.

Where walkways are provided, plaques stating the maximum design loads and any restrictions on load patterns shall be installed on the gantry adjacent to each point of access.

Gantries are also to be provided with separate reference plates to allow provision of a unique reference number for identification in accordance with the asset management register. For ease of identification these reference plates are to be positioned such that they can easily be seen from both directions, from approaching vehicles using the nearside lane. The plates and letters shall conform to the relevant Australian standard.

