TCS 064 - 2019

Specification

for the

Supply and Installation

of

LUMS Gantry Identification System

April 2019

Revision: Rev A

keeping victorians connected

Foreword

This specification has been developed by VicRoads. It is one of a number of technical specifications, and associated standard drawings, which set out the requirements for roadside ITS devices, traffic signal equipment and other electrical equipment and associated devices and control systems.

This specification is intended for use in all relevant works undertaken by or on behalf of VicRoads.

VicRoads Standard Drawings, Specifications and Guidelines are available for downloading from VicRoads website at the following address http://www.vicroads.vic.gov.au under Business & Industry > Technical documents search

Specification updates. VicRoads specifications and associated standard drawings are subject to periodic review. To keep the specifications up to date, amendments or new editions are issued as necessary. It is therefore important for users of VicRoads specifications to ensure that they have the latest version and associated amendments.

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PREFACE

A. CHANGES TO THIS SPECIFICATION

B.1 The main changes to this specification from the previous version are listed below:

Version 1 updates made are as follows;

- History table updated;
- Colour requirements of signs updated;
- Minimum connection details added;
- Standard mounting options drawings added;
- New Face Design added

Revision History

Version	Revision	Date	Author	Description
2013	A	September 2013	SJS	Initial release
2019	A	April 2019	NDS*	Revision and added installation requirements

**Network Design Services*

Contents

SECTION 1 SCOPE AND GENERAL 6

1.1 SCOPE 6
1.2 GENERAL 6

SECTION 2 RELATED SPECIFICATIONS AND DRAWINGS 7

SECTION 3 ACRONYMS 8

SECTION 4 IDENTIFICATION SYSTEM 9

4.1 GENERAL 9
4.2 FREEWAY IDENTIFIERS 10
4.3 DISTANCE IDENTIFIER 11
4.4 DIRECTION 11

SECTION 5 SIGN REQUIREMENTS 13

5.1 SIGN DETAILS 13

SECTION 6 MINIMUM INSTALLATION REQUIREMENTS 15

6.1 GENERAL REQUIREMENTS 15
6.2 CONNECTION DETAILS FOR INSTALLATION OF NEW SIGNS 15
6.3 RETROFITTING EXISTING LUMS IDENTICATION SIGNS ON SUPPORT STRUCTURES 16

SECTION 7 STANDARD DRAWINGS 17

7.1 FACE DESIGN FOR LUMS IDENTIFICATION SIGNS 17
7.2 MOUNTING OPTION FOR NEW LUMS IDENTIFICATION SIGNS 18
7.3 MOUNTING OPTIONS FOR RETROFITTING OF LUMS IDENTIFICATION SIGNS 19

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

1.1.1 This document covers minimum requirements for the design and installation VicRoads Lane Use Management Sign (LUMS) Gantry Identification System.

1.1.2 The document also covers remedial works to be undertaken where LUMS signs have been previous attached to the support structures using an adhesive or double-sided tape.

1.1.3 Compliance with this ensures consistency of the signs used on the Managed Motorway Network and improved safety for the travelling public.

1.2 GENERAL

1.2.1 The LUMS Gantry Identification System has been developed to enable easy identification of freeway LUMS gantries.

1.2.2 The system has been designed to be implemented on all Managed Motorway Network where LUMS have been installed.

1.2.3 The identification system is intended to provide an easy method to identify the freeway, the distance from a predetermined location and the traffic direction, i.e. inbound and outbound.

1.2.4 Identifying LUMS gantries based on a distance rather than by a gantry number enables future gantries to be added in between existing gantries while continuing to maintain a sequential numbering system.

1.2.5 The identification system also provides a mechanism of identifying and reporting of faulty LUMS signs to allow repairs to be undertaken efficient and timely manner.

1.2.6 Travelling public in need of assistance can use the identification signs to provide their location relative to the road network when seeking assistance from TMC.

SECTION 2 RELATED SPECIFICATIONS AND DRAWINGS

2.1 The fabrication and supply of all components shall conform with all relevant Australian Standards.

2.2 All installation works shall conform to the relevant VicRoads specifications and related specifications and standards as indicated throughout this document.

2.3 The following related Australian Standards are defined:

AS 1743	Road signs - Specifications
AS 1744	Standard Alphabets for Road Signs
AS 2144	Traffic Signal Lanterns
AS/NZS 1906.1	Retroreflective materials and devices for road traffic control purposes – retroreflective sheeting

2.4 The following related documents are defined:

SRRS	VicRoads Standard Road Referencing System (SRRS)

2.5 The following related VicRoads Standard Drawings are defined:

577553	Typical sign gantry identification – Sign-face design – P1-V152-1
577554	Typical sign for new LUMS gantry identification – Mounting arrangement options
577555	Typical sign for retrofitting of existing LUMS gantry identification – Mounting arrangement options

SECTION 3 ACRONYMS

3.1 The acronyms use in this document shall be interpreted as follows:

AS	Australian Standard
CBD	Central Business District
CWL	CityLink Western Link
F	Forward
LUMS	Lane Use Management Signs
MF	Monash Freeway
PFW	Princess Freeway West
R	Reverse
RR	Ring Road
TF	Tullamarine Freeway
WGF	WestGate Freeway
AS	Australian Standard
Hollo-bolt	Where a Hollo-bolt is referred to in the document it is based on a “Lindapter Hollo Bolt”. An approved equivalent bolt of similar characteristics may be adopted.

SECTION 4 IDENTIFICATION SYSTEM

4.1 GENERAL

4.1.1 The identification system has been designed to provide the following details:

- Freeway Identifier 1. The designated freeway route number under the Statewide Route Number Scheme e.g. M1 for the Monash Freeway;
- Freeway Identifier 2. Used on some freeways that have two sections such as the east and west to clearly identify the relevant section e.g. ‘E’ for Eastern section of the M1 east and ‘W’ for the western section M1;
- Freeway Identifier 3. Specifies the distance of the LUMS gantry from the specified starting point; and
- Freeway Identifier 4. The direction of traffic, i.e. e.g. either Forward (F) (away from the specified starting point) or Reverse (R) (towards the specified starting point), in accordance with VicRoads SRRS.

Below is an example of an identification sign showing each of the identifiers.

M1	E	020	F
Freeway Identifier 1	Freeway Identifier 2	Freeway Identifier 3	Freeway Identifier 4

4.1.2 The LUMS identification sign shall be located on the top left corner of the LUMS support structure, adjacent to the support leg.

4.1.3 There shall be one LUMS identification sign per LUMS gantry face and the LUMS identification sign shall be placed so that it faces the oncoming traffic. Figure 1 below shows an example of a LUMS gantry with a LUMS identification sign attached.

4.1.4 The LUMS Identification sign may be installed on a LUMS support structure of a LUMS group where there is no gantry provided, eg. LUMS may be installed on a bridge structure. Installation location on bridge structures shall be the same locations as per a gantry installation.

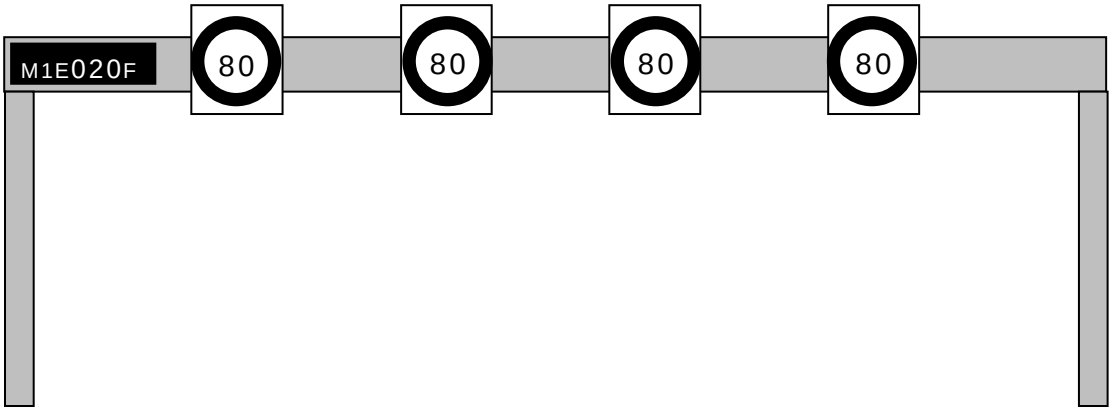


Figure 1 – Example LUMS Gantry with Identification sign attached

4.2 FREEWAY IDENTIFIERS

4.2.1 Identifier 1 is the freeway's route number under the Statewide Route Number Scheme, e.g. Monash Freeway is designated M1.

4.2.2 Identifier 2 is used on some freeways that have two sections such as east and west to clearly identify the relevant section.

4.2.3 Table 1 below shows each of Melbourne's freeways and the associated identifiers.

Freeway Identifier 1 (Freeway Route No.)	Freeway Identifier 2 Section	Freeway Name(s)
M1	E	CityLink Southern Link, Monash Freeway, Princes Freeway East
M1	W	WestGate Freeway, Princes Freeway West
M80	Not required	Ring Road
M8	Not required	Western Freeway, East West Link (CityLink Western Link to Ring Road)
M79	Not required	Calder Freeway
M2	Not required	CityLink Western Link, Tullamarine Fwy
M31	Not required	Hume Freeway
M3	Not required	East West Link (Hoddle Street to City Link Western Link) Eastern Freeway, East Link, Frankston Freeway
M420	Not required	South Gippsland Freeway

M11	Not required	Mornington Peninsula Freeway (including Peninsula Link)

Table 1: Section Identifiers

4.3 DISTANCE IDENTIFIER

4.3.1 Identifier 3 is a numeric identifier that specifies the distance of the LUMS from the fixed specified starting point. The distance is specified in kilometres multiplied by 10. Eg. **020** is 2.0km from the specified starting location. If the number was **455,** it would indicate a distance of 45.5km from the specified starting location.

4.3.2 By using distance measurements to identify the gantries, any future gantries installed on the freeway network can continue to be identified using the same identification system.

4.3.3 For most freeways, the location from which distances are measured is the CBD.

4.3.4 For the M80, the distance is measured from Princess Freeway West.

4.4 DIRECTION

4.4.1 Identifier 4 details the direction of traffic flow.

4.4.2 The direction of traffic flow is described as either Forward (F) (away from the specified starting location) or Reverse (R) (towards the specified starting location).

4.4.3 The direction is determined based on the designated *Road Start and* end (refer Table and also as described in VicRoads SRRS).

4.4.4 Table 2 below details the designated road starting points for Melbourne's freeways.

Freeway No.	Freeway Name(s)	Road Starting Point
M1	CityLink Southern Link, Monash Freeway, Princes Freeway East	Power Street
M1	West Gate Freeway, Princes Freeway West, Ring Road	Power Street
M80	Ring Road	PFW
M8	Western Freeway, East West Link (CityLink Western Link to Ring Road)	CWL
M79	Calder Freeway	TF
M2	CityLink Western Link, Tullamarine Freeway	WGF

M31	Hume Freeway	RR
M3	East West Link (Hoddle Street to CityLink Western Link), Eastern Freeway, EastLink, Frankston Freeway	CWL
M420	South Gippsland Freeway	M1
M11	Mornington Peninsula Freeway (including Peninsula Link)	Dingley Bypass

Table 2: Specified Freeway Start Points

SECTION 5 SIGN REQUIREMENTS

5.1 SIGN DETAILS

5.1.1 Identifier 1 and 2 shall be yellow text on a green background for non-toll roads and yellow text on a blue background for toll roads eg. Transurban. The colours are to be standard colours and are to comply with Section 4.5 of AS 1743:2018 Road Signs Specification

5.1.2 Identifier 3 and 4 on the sign shall be white lettering on a black background.

5.1.3 Sign finish shall be Class 1 retro-reflective with the exception of the black background which is to be non-reflective.

5.1.4 Where the LUMS identification sign is to be bolted onto the support structure the sign material shall be 1.6mm 5052 or 5251 aluminium as detailed in Section 4.6.2 of AS 1743 – Road Signs Specification.

5.1.5 Lettering shall be Series E Alphabet as detailed in AS 1744 -Standard alphabets for road signs.

5.1.6 The letter height shall be:

- 180mm for the Freeway Identifiers, distance identifier and Direction;

Figure 2 and 3 show the lettering heights.

5.1.7 The sign shall be large enough to provide a 45mm border on the top and bottom sides.

5.1.8 The sign shall be large enough to provide a 90mm border at the left and right ends of the sign.

5.1.9 Self-adhesive vinyl signs are to be used be installed on new gantry installation where possible. The material requirements for the sticker type signs are as follows:

a. Self-adhesive vinyl reflective sign;
b. Class 1 retro-reflective material;
c. Warranted outdoor durability of minimum twelve years;

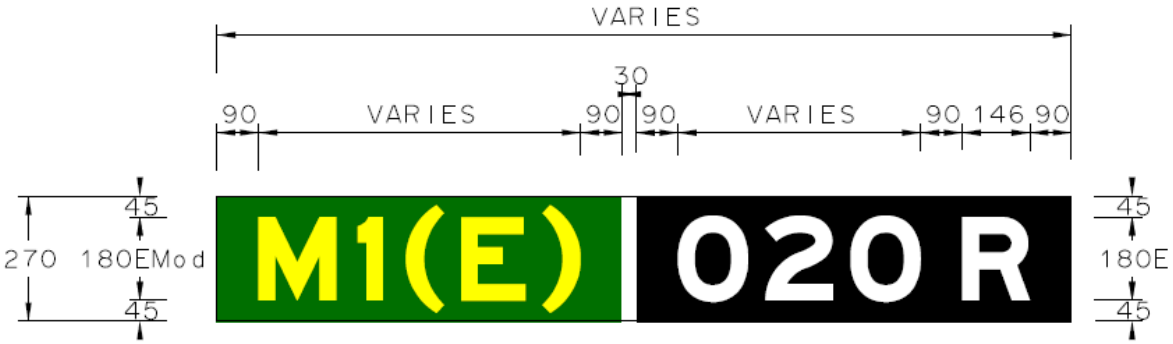


Figure 2 – Sign Lettering Example

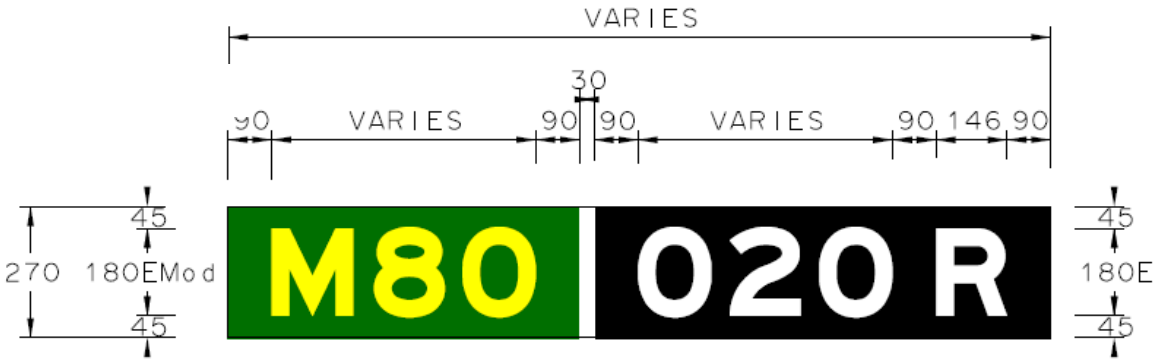


Figure 3 – Sign Lettering Example

SECTION 6 MINIMUM INSTALLATION REQUIREMENTS

6.1 GENERAL REQUIREMENTS

6.1.1 Self-adhesive vinyl reflective class 1 type LUMS Identification signs are the preferred option and should be used where possible.

6.1.2 The attachment of the LUMS Identification sign to the gantries or other structures shall be such that it ensures that the sign remains connected to the support structures for the duration of the design life of the sign.

6.1.3 The LUMS Identification signs shall be attached to a structure as close as possible to the support leg where the vibration of the structure is minimum.

6.2 CONNECTION DETAILS FOR INSTALLATION OF NEW SIGNS

6.2.1 To attach the LUMS Identification signs to the support structures there are a number of options available.

The options available are as follows:

a. Self-adhesive vinyl type reflective Class 1 sign to be directly adhered to the steel gantry.

b. Bolted connection may be used where the depth of the support structure member is greater or equal to 300mm and the sign shall consist of an aluminium backing plate;

c. Bolted connection shall be used where the depth of the support structure is less than 300mm and the sign shall include an aluminium backing plate;

d. Bolted connection shall be used where the sign is to be attached to a concrete surface and the sign shall include an aluminium backing plate;

The attached drawings provide connection detail options for new and retrofitting of signs.

6.2.2 Where a LUMS Identification sign is to be attached to a steel structure it shall be connected using a minimum of three HB08 Hollo bolts or equivalent equally spaced along the length of the sign. Suitable washers of minimum 30mm external diameter shall also be provided. The Hollo bolt shall have a tightening torque as per the manufacturer’s specification

6.2.3 LUMS Identification signs to be installed on concrete support structures shall be bolted on. Self-adhesive vinyl type reflective signs attached to concrete surface shall not be used on concrete structures.

6.2.4 Where a LUMS Identification sign is to be attached to a concrete structure it shall be connected using a minimum of three M8 ChemSet anchors equally spaced along the length of the signs. Suitable washers of minimum 30mm external diameter shall be provided. The ChemSet anchors are to be installed in a manner that avoids existing reinforcement in the concrete structure.

6.2.5 The edge distance to be adopted for the connection of the bolts to the sign shall be no less than 50mm.

6.2.6 Self-adhesive vinyl reflective class 1 signs that are to be attached to steel gantries shall not protrude above or below the steel support member. Self-adhesive vinyl reflective class 1 signs cannot be used for gantries where the minimum depth of the support member is less than 270mm.

6.2.7 Where the surface to which the LUMS is uneven or has protrusions then the LUMS identification sign shall have an aluminium backing plate and be bolted onto the support structure.

6.2.8 All LUMS identification signs on new support structures shall be installed prior to the support structure being delivered to site.

6.2.9 Where the LUMS identification signs are to be bolted on support structures greater than 300mm depth the connection details are to be engineered designed by a VicRoads prequalified designer in structures. Refer to Option 3 on Drawing No. 577554 of the attached drawings.

6.2.10 Where the LUMS identification signs are going to protrude above and below the support structure the LUMS identification sign shall be centrally placed on the support member. Refer to Option 2 on Drawing No. 577554 of the attached drawings.

6.3 RETROFITTING EXISTING LUMS IDENTICATION SIGNS ON SUPPORT STRUCTURES

Existing LUMS identification signs that are attached to support structures using adhesive or double- sided tape are to be retrofitted onto the existing support structures adopting one of the following methods:

a. Where an aluminium LUMS Identification sign is currently attached to a steel support structure using an adhesive or double-sided tape it shall be also bolted to the structure using as a minimum 3 No. HB08 Hollo bolts or equivalent. Hollo-bolts of an appropriate length are to be added to the existing sign. The bolts are to be placed 50mm from either end of the sign and equally spaced along the centre line of the LUMS Identification sign. The HN08 Hollo-bolts are to have an additional washer with a minimum external diameter of 30mm securing the sign in position.

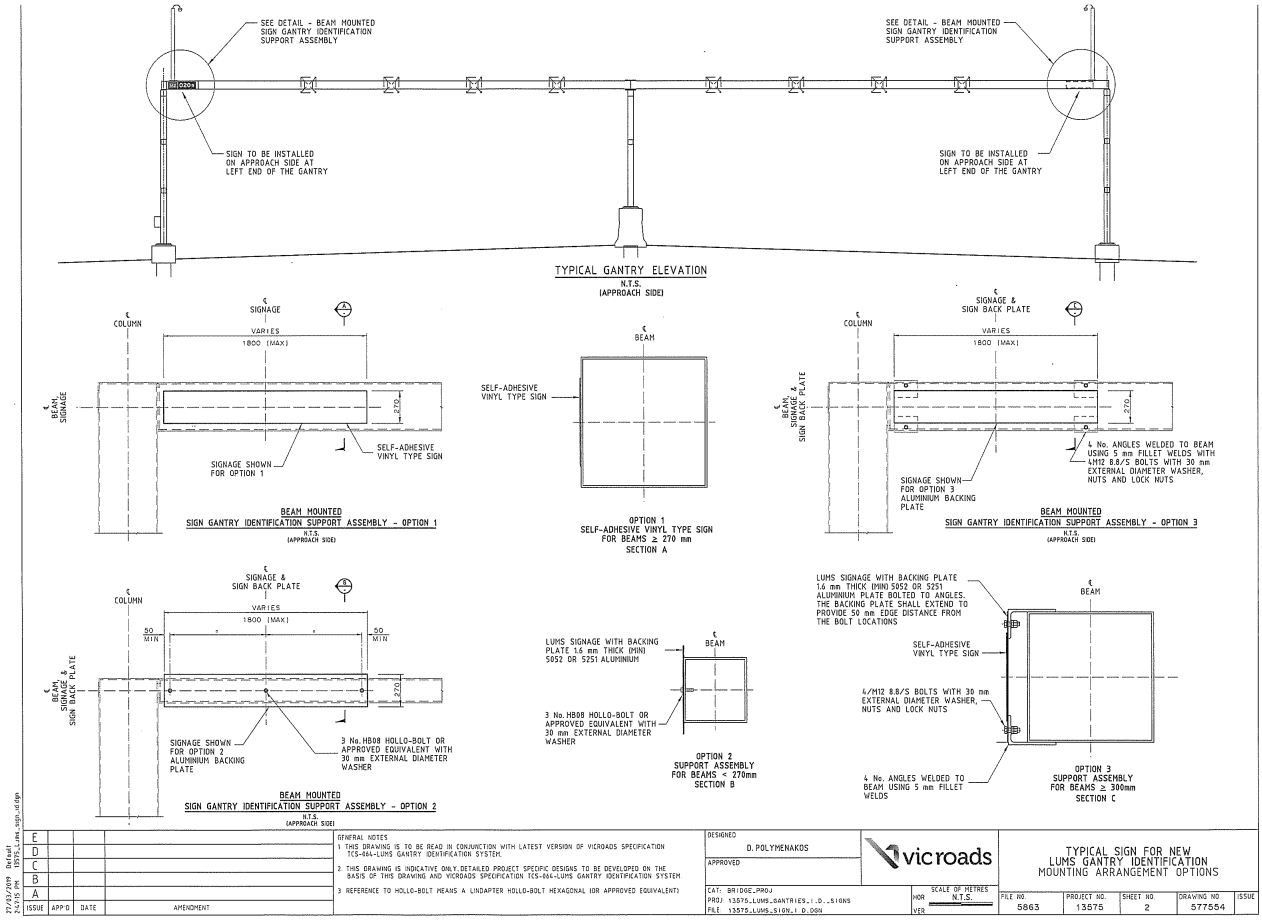
b. Where an existing LUMS identification sign has been removed then it shall be re-attached to the gantry using one of the options detailed under new sign installation.

c. Where a LUMS Identification sign is to be attached to a concrete structure it shall be connected using a minimum of three M8 ChemSet anchors equally spaced along the length of the signs. The M8 ChemSet anchors are to have an additional washer with a minimum external diameter of 30mm securing the sign in position. The ChemSet anchors are to be installed in a manner that avoids existing reinforcement in the concrete structure.

SECTION 7 STANDARD DRAWINGS

7.1 FACE DESIGN FOR LUMS IDENTIFICATION SIGNS

7.2 MOUNTING OPTION FOR NEW LUMS IDENTIFICATION SIGNS



7.3 MOUNTING OPTIONS FOR RETROFITTING OF LUMS IDENTIFICATION SIGNS