

TCS 011-1-1999



**SPECIFICATION
FOR
ROADSIDE CABINETS**

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PREFACE

A. GENERAL

This specification has been developed by the VicRoads 'Traffic and Transport Integration Department' (herein called the "Department"). It is one of a number of technical specifications, and associated standard drawings, which set out the requirements for "on-road" ITS devices, traffic signal equipment and other electrical equipment and associated devices and control systems.

This specification, and associated standard drawings, is intended for use in all relevant works undertaken by or on behalf of VicRoads.

B. APPROVED PRODUCTS

All equipment covered by this specification shall hold current VicRoads 'Type Approval' certification. To obtain VicRoads 'Type Approval' the manufacturer/supplier must submit a written request, together with a sample product, to VicRoads for evaluation. Such requests shall include all relevant documentation demonstrating compliance with this specification

Type Approval issued in accordance with this specification does not constitute automatic approval against future versions of this specification. Where it is considered necessary, VicRoads may withdraw current Type Approval and request that the affected product be re-submitted for evaluation against future versions of this specification.

All equipment covered by this specification shall be manufactured by an approved manufacturer under a VicRoads approved Quality Assurance System and shall be subject to all requirements of audit therein.

C. ELECTROMAGNETIC COMPATIBILITY (EMC)

All equipment covered by this specification shall comply with all relevant requirements of the Australian Communications Authority (ACA) for EMC. Such equipment shall comply with the requirements of AS4251.1 Electromagnetic compatibility – Generic emission standard – Part 1: Residential, commercial and light industry.

For equipment complying with the ACA's 'Level 1' category a copy of a 'Declaration of Conformity' shall be supplied to VicRoads.

For equipment complying with the ACA's 'Levels 2 and 3' categories, a copy of a test report (from a NATA approved testing facility) showing compliance

shall be supplied to VicRoads. Equipment falling into either of these two categories (*i.e.* Level 2 and 3) shall be labelled with a conforming 'C-Tick'. 

D. TELECOMMUNICATIONS EQUIPMENT

All telecommunications equipment shall comply with relevant requirements of the Australian Communications Authority (ACA). Such equipment shall be labelled with an ACA issued

'A-Tick' .

Amendment History		
Amendments	Date Issued	Details
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1.0 SCOPE AND GENERAL

1.1 GENERAL

This document specifies the requirements for a roadside cabinet which is suitable for housing electrical and electronic equipment for the following applications:

- Incident Detection;
- Closed Circuit Television (CCTV).

It is intended that cabinets from different manufactures will be physically interchangeable and that the designed cabinet is capable of being utilised for other roadside functions.

1.2 REFFERRED DOCUMENTS

The following documents are referred to in this Specification

i. Australian Standards:

AS 1939	Classification of degree of protection provided by enclosures for electrical equipment
AS 2700	Colour standards for general purposes
AS 2578	Traffic signal controllers - physical and electrical compatibility
AS 3000	SAA Wiring rules
AS 3001	Approval and test specification for definitions and general requirements for electrical materials and equipment

ii. Standard Drawings:

TC-2002	Cabinet - Installation details - Incident detection
TC-2003	Roadside cabinet
TC-1603	Rag bolt assembly for cabinet

Where no specific reference is made to an Australian Standard, the materials and processes used shall conform to the relevant Australian Standard or generally accepted practice.

1.3 DEFINITIONS

The following documents are referred to in this Specification
For the purpose of this document, the following definitions apply.

i. Cabinet

The weatherproof enclosure that provides physical protection and houses electrical and/or electronic equipment and comprises a body section, a roof, a base section and an access door.

ii. Incident Detection Equipment

Apparatus for detecting the presence of vehicles on the roadway and usually comprising a power supply, detection modules and transmission unit.

iii. CCTV Equipment

Apparatus for relaying camera functions and for transmitting video images to VicRoads.

iv. Approval

The acceptance by the System Implementation Section (SIS) of individual components, processes or methods for like or similar applications and purposes.

v. Product Acceptance

A process by which equipment and parts shall conform to samples previously supplied to and formally accepted by VicRoads System Implementation Section of the Traffic & Road Use Management Department. Such acceptance is subject to the SIS procedure for Product Evaluation which requires samples to be submitted by the supplier for evaluation and acceptance. Acceptance of the submitted product is acknowledged by the issue of a “Certificate of Type Approval” or “Notification of Acceptance for Tender Purposes”.

2.0 MECHANICAL AND PHYSICAL REQUIREMENTS

2.1 DESIGN AND CONSTRUCTION OF THE CABINET

The cabinet shall be of rigid construction using methods and materials which ensure that it will have the strength and durability necessary to withstand normal conditions of transportation, installation and operation anywhere within the State of Victoria for a period of not less than 15 years.

2.1.1 Contours

The interior and exterior of the cabinet shall be free from sharp corners and projections. All exterior corners of the cabinet and roof shall have a minimum external radius of 3 mm. All accessible edges shall be de-burred. The exterior of the cabinet shall present a clean and attractive appearance and be free from fasteners such as bolts, screws and pop-rivets

2.1.2 Dimensions

The external dimensions of the cabinet shall conform to the following:

(All dimensions in mm)	Nominal dimension	Tolerance (mm)
HEIGHT	1345	+5, -0
DEPTH	400	± 2
WIDTH	760	± 2

The cabinet shall be constructed in such a manner as will permit the side having the longest base dimension to be mounted parallel with and immediately adjacent to a wall, fence or similar structure.

2.1.3 Access to Securing Bolts

Access shall be provided to the securing bolts so as to facilitate effective installation and removal of the cabinet from the base.

2.1.4 Provision for Conduit Entry

The base of the cabinet shall be arranged to accommodate cable entry by means of:

2 x 100 mm and 1 x 50 mm conduits as detailed in Standard Drawing TC-2002 Cabinet - Installation Details - Incident detection.

2.1.5 Weather Resistance

The cabinet shall comply with the requirements prescribed for degree of protection IPX6 in AS 1939. The roof shall be sloped to provide run-off (e.g. of rain water) to the rear of the cabinet.

2.1.6 *Materials*

The principal construction material for the cabinet shall be A5052 H32 or A5251 H34 marine grade aluminium sheet with a minimum thickness of 2.5mm, however, it is permissible for the base section of the cabinet to be cast, using an appropriate aluminium alloy or an approved alternative material.

Reinforcing shall be provided as necessary to produce a rigid structure (See Section 3 Mounting and Rigidity). All materials shall be either inherently corrosion resistant or be treated and/or isolated against electrolytic and environmental corrosion.

Any jointing shall be carried out in accordance with any relevant Australian Standards and generally accepted principles of sound practice.

2.1.7 *Identification*

The cabinet shall carry readily accessible identification markings (by securely affixed plate or other approved means) which shall include the following information: the name and address of the manufacturer; the batch and serial number of the cabinet and the month and year of manufacture.

2.2 DOOR

A door shall be incorporated in the cabinet to provide direct access to all internal equipment for installation and maintenance purposes. The size of the door opening shall be as close as practicable to the external dimensions of the larger side the cabinet, consistent with mechanical strength requirements.

2.2.1 *Design*

The door shall be stiffened and shall be hinged with two hinges, at least 90mm long and the pin shall have a minimum diameter of 6 mm, which shall be constructed of non ferrous materials of a type that does not require lubrication to prevent seizing. Hinges shall not protrude beyond the general cabinet dimensions.

2.2.2 *Security*

The door shall be lockable and secured in the closed position at two anchorage points to prevent unauthorised access. The lock(s) shall be standard “VicRoads” cylindrical lock or an alternative type approved by VicRoads.

2.2.3 Retaining Device

The door shall be capable of being opened through a minimum of 110 degrees from the closed position and shall be provided with a device which shall retain the door in the open position when required.

2.2.4 Earthing Strap

A flat braided copper conductor of 6mm² minimum, shall be fitted in the vicinity of the lower hinge to provide earthing of the door in accordance with AS 3000.

2.2.5 Storage Pocket

A pocket shall be provided on the inside of the door to provide space for the storage of items such as service cards and circuit diagrams. The pocket shall have dimensions of 200 mm high x 300 mm wide x 20 mm deep and shall be provided with a finger slot or other suitable means to facilitate removal of the contents.

2.2.6 Seal

The door shall be provided with a serviceable, durable and resilient weatherproof seal designed to last a minimum of 5 years and must be easily replaced.

2.3 VENTILATION

Adequate ventilation shall be provided to prevent condensation and undue temperature rise inside the cabinet under all weather conditions. Ventilation shall be provided near the top (between the roof and the body section) and near the base. All ventilation openings shall be designed to prevent the ingress of dust and insects, by the provision of a suitable filtering medium or other effective means. If stand-offs are used in the construction of the cabinet, these shall be of a non ferrous material and shall be sealed to prevent ingress of water.

2.4 EXTERIOR FINISH

All exterior surfaces of the cabinet shall have a durable gloss finish of an approved polyurethane, non-sacrificial anti-graffiti pigmented coating applied in accordance with the manufacturers directions. The cabinet is to be coloured Smoke Blue - T33, in accordance with AS 2700.

2.5 BASE

The base of the cabinet is to be designed to allow the cabinet to be securely mounted on the standard controller base and to allow for the provision for conduit entry as in Section 2.1.4.

3.0 MOUNTING AND RIGIDITY

3.1 MOUNTING

The cabinet shall be designed to be mounted on the concrete footing by means of cast-in securing bolts (rag bolt assembly) arranged in accordance with Fig. 2.3 of AS 2578. The cabinet shall be of sufficient rigidity to not be distorted when mounted on an uneven concrete footing.

3.1.1 Frangibility

The base of the cabinet shall be fastened to the securing bolts by means of frangible plates or fittings so that, in the event of a severe impact (such as from an errant motor vehicle) the controller will be dislodged from its mountings without damage to the mounting bolts.

3.1.2 Rigidity

The top of the cabinet when mounted on the footing shall not deflect more than 10 mm when a force of 2 kN is applied at the top of the cabinet in any direction. Furthermore, the mounting shall be sufficiently robust to withstand vandalism or minor impact from a motor vehicle.

4.0 ELECTRICAL PROVISIONS

4.1 CONNECTION TO EXTERNAL EQUIPMENT

Provision shall be made for entry for all external cables through the base of the cabinet. The size of the entry hole shall be in accordance with Fig. 2.3 and Fig. 2.4 of the AS 2578.

4.2 DANGER SIGN

A warning sign “DANGER 240 VOLTS” shall be clearly fastened to the inside of the door, in accordance with AS 3000 and comply with the following requirements:

- a. For symbolic signs - Sign No A2.7 in appendix A of AS 1319.
- b. For text type signs - Appendix A of AS 1319

5.0 INTERNAL EQUIPMENT MOUNTING ARRANGEMENTS

5.1 MOUNTING RAILS

The cabinet shall be supplied with two full height vertical rails on each side. The rails shall comprise 27 RU lengths of Mounting Angle Type C as manufactured by MFB Products P/L of Wantirna South, Victoria, and shall be

mounted to be 650mm between hole-centres on each side. Two horizontal rails running the full depth of the cabinet shall be fixed to each side to provide for the sturdy mounting of the vertical rails. The horizontal rails shall be provided with nitted holes at 50mm centres. This is to allow for the vertical rails to be mounted in a range of fore and aft positions in the cabinet. As an alternative to nitted holes, the rails may be punched at 50mm centres to take chassis nuts for mounting the vertical rails. In the latter case, sufficient space will need to be provided between the horizontal rail and the cabinet wall to permit easy relocation of the screws and nuts securing the vertical rails.

5.2 SHELF

A shelf, 300mm deep shall be installed on the vertical rails within the cabinet. The shelf shall have all edges folded to give rigidity and all sharp edges removed. The shelf shall be provided with two mounting brackets on each side, with screws and nuts, to allow location at any position on the vertical MFB rails. The shelf shall be capable of supporting a weight of 45 kg.

5.3 MOUNTING PANEL

A vertical mounting panel shall be installed on the vertical rails within the cabinet. The panel shall be 400mm high and made of 2mm thick aluminium sheet, with all edges folded for rigidity and all sharp corners removed. The panel shall be fixed to the rails by three screws and nuts evenly spaced on each side.

APPENDIX
REQUIREMENTS FOR TYPE APPROVAL
OF A
ROADSIDE CABINET

A1. GENERAL

To enable assessment for the purpose of granting Type Approval, the supplier is to submit a formal request for Type Approval accompanied by the following:

- a. A complete working sample of the cabinet.
- b. An outline drawing showing the general presentation and overall dimensions of the complete cabinet.
- c. Documentation to demonstrate that the cabinet has been manufactured and supplied under an approved quality assurance system.
- d. Documentation to demonstrate that the cabinet conforms to the requirements of VicRoads Specification. This may be by means of submitting test results from approved and appropriately qualified independent testing organisations, or providing the manufacturer's assurance that the product complies with each paragraph of the specification.

A2. REQUIRED NATA ACCREDITED TESTING

Notwithstanding A1 above, the supplier shall submit test results from a NATA accredited testing organisation to demonstrate compliance with the following:

Clause 2.1.5	IP Rating
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A3. OTHER REQUIRED TESTING

- a. VicRoads may require additional information or testing to be carried out as part of its evaluation of the product.
- b. If the product is approved, a Certificate of Type Approval will be provided to the supplier. Until such time as this Certificate is issued, the product is not to be used in the State of Victoria.

A4. ASSESSMENT PROCEDURE

The assessment procedure for a Roadside Cabinet will include, but not be limited to, the following:

- a. Assessment of construction, workmanship and critical dimensions.
- b. Evaluation of the submitted data against the requirements of the specification

Where some of these procedures have been completed prior to formal submission, the results will be considered in the evaluation, provided there is no relevant change in the design. The supplier is to state whether tests carried out prior to formal submission were carried out on an identical sample.

STANDARD DRAWINGS

- TC-2002** Cabinet - Installation details - Incident detection
- TC-2003** Roadside cabinet
- TC-1603** Rag bolt assembly for cabinet