Technical Specification

Transport and Main Roads Specifications MRTS221 Help Phones

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Queensland
Government

Contents

1   Introduction

This Technical Specification defines the design, supply, installation, testing and commissioning, performance, documentation, training and maintenance requirements for help phones.

The help phones shall be installed on the roadside to enable motorists to contact the Principal's Traffic Management Centre (TMC) to report an incident or request assistance.

For the purpose of this Technical Specification, a help phone installation operating on leased telecommunications services includes one or more combinations of the following:

- help phone equipment enclosure

- supporting infrastructure including mounting, conduits, pits

- power suppliers: mains power on standalone, and

- static signs.

This Technical Specification shall be read in conjunction MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements,* other Technical Specifications, and Transport and Main Roads Standard Drawings as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

1.1   Standard specification

All equipment and material, where not otherwise specified, shall be in accordance with the appropriate Australian Standard Specifications, where such exist, and in their absence, with appropriate British Standard Specifications.

Where standard specifications are quoted or implied, the latest version shall be applicable, including its amendments to date.

All electrical installation and associated equipment shall comply with the requirements of AS/NZS 3000.

All telecommunications equipment shall comply with relevant Australian Communications & Media Authority (ACMA) technical standards and requirements.

All radio communications shall comply with the requirements of the Australian Department of Communications.

2   Definition of terms

The terms defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional terminology relevant under this Technical Specification are defined in Table 2 below.

Table 2 – Definitions of Terms

Term	Definition
4G	Fourth-Generation cellular telecommunications network
5G	Fifth-Generation cellular telecommunications network
ACMA	Australian Communications & Media Authority

Term	Definition
Cellular	Pertaining to a wireless telecommunications network comprising cells, such as 4G or 5G
dB(A)	Sound level measurement unit corrected for average human hearing response
DTMF	Dual-Tone Multi Frequency
Full duplex	Ability to transmit and receive concurrently at full speed
GPRS	General Packet Radio Services
GSM	Global System for Mobile Communications
HSDPA	High Speed Downlink Packet Access
NextG	Telstra's Next G cellular network
PABX	Private Automatic Branch Exchange
PSTN	Public Switched Telephone Network
Vdc	Volts (Direct Current)
TMC	Traffic Management Centre

3 Reference documents

The requirements of the referenced documents listed in Table 3 of MRTS201 *General Equipment Requirements* and Table 3 below apply to this Technical Specification. Where there are inconsistencies between this Technical Specification and the referenced MRTS documents, the requirements specified in this Technical Specification shall take precedence.

Table 3 - Referenced Documents

Reference	Title
AS 2700	*Colour Standards for general purposes*
AS 60529	*Degrees of protection provided by enclosures (IP Code)*
AS/CA C002	*Analogue Interworking and Non-interference Requirements for Customer Equipment for Connection to the Public Switched Telephone Network*
AS/CA S003.1	*Customer Access Equipment for Connection to a Telecommunications Network*
AS/CA S003.3	*Customer Access Equipment for Connection to a Telecommunications Network*
AS/CA S004	*Voice Frequency Performance Requirements for Customer Equipment*
AS 4262.2	*Telecommunication Overvoltages Protection of equipment*
AS/NZS 60950.1	*Information Technology Equipment - Safety*
AS/NZS 61000.6.1	*Generic standards—Immunity for residential, commercial and light industrial environments*
AS/NZS 61000.6.3	*Generic standards—Emission standard for residential, commercial and light-industrial environments*
IEC 60950-1	*Information technology equipment - Safety - Part 1: General requirements*
MRTS01	*Introduction to Technical Specifications*
MRTS50	*Specific Quality System Requirements*
MRTS91	*Conduits and Pits*

Reference	Title
MRTS201	*General Equipment Requirements*
MRTS263	*Standalone Solar (PV) Power Systems*
Queensland MUTCD	Queensland *Manual of Uniform Traffic Control Devices*
QGTM Part 9	*Queensland Guide to Traffic Management, Part 9: Traffic Control Systems – Strategies and Operations*
RPDM	*Road Planning and Design Manual 2nd Edition*
TC9799	*Help Telephone handset and Guide signing standard installation – General layout, installation and fabrication details*

4   Quality system requirements

The quality system requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional quality system requirements relevant under this Technical Specification are defined below.

The Principal reserves the right to evaluate the subcontractor's quality system throughout the contract. Arrangements for conducting evaluations shall be at a time convenient to both parties and shall be confirmed in writing.

4.1   Samples for acceptance

The requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

5   Functional requirements

The help phones shall be easy and intuitive to operate by the general public in a roadside environment without any prior training. Calls shall be able to be originated by either a motorist at the roadside help phone, or the operator in the Principal's TMC. The help phones shall be provided to operate in accordance with *Queensland Guide to Traffic Management* (QGTM) Part 9.

Preference shall be given to a help phone design that allows connection with the TMC via the following options:

1. The Principal's private copper communication lines. The help phone shall be allocated a standard Private Automatic Branch Exchange (PABX) extension number. The help phone shall be capable of autodialling a specified internal extension number associated with the PABX at the Principal's TMC.

2. The Public Switched Telephone Network (PSTN). The help phone shall be allocated a standard 10-digit phone number. The help phone shall be capable of autodialling a specified external line number associated with the PABX at the Principal's TMC, or

3. Use a full duplex, cellular phone based on standard public telecommunication networks (such as 4G / 5G) or later generation of public cellular telephone networks. Cellular phones shall connect with the network that provides the most reliable coverage at the site. The help phone shall be allocated a standard 10-digit phone number. The help phone shall be capable of autodialling a specified external line number associated with the PABX at the Principal's TMC.

Where more than one of the above options of connection to the Principal's TMC is available (or economical to provide) at the help phone site, help phones shall be connected directly to the Principal's private communication lines as the first preference. Cellular connections may be used where a copper connection is not available or provides unreliable service. Leased communication channels shall use the Principal's preferred network carrier as advised by the Principal's voice communications co-ordinator.

6 Operational requirements

The operational requirements defined in MRTS201 *General Equipment Requirements* apply to equipment provided under this Technical Specification. Additional operational requirements for equipment provided under this Technical Specification are described below.

6.1 Automatic volume control

Help phones shall have an automatic volume control so they can operate in a high noise environment with up to 95dB(A) of traffic noise plus 85dB(A) of air supply noise.

6.2 Call answering at Help Phone

The help phone shall sound a ringing tone at the site upon receiving a call from the operator in the Principal's TMC until the call is answered.

Where a handset is provided, the call from the operator in the Principal's TMC shall be considered as answered upon lifting the handset.

Where a handset is NOT provided, the call shall be considered as answered after a variable period between 0 and 10 seconds (initially set to 4 seconds) after the call is initiated by the TMC operator.

6.3 Call initiation at Help Phone

The help phones shall have the facility to initiate the call dialling the Principal's TMC and making a connection. The phone number of the operator in the Principal's TMC shall be able to be stored in the phone unit. The phone shall use Dual-Tone Multi Frequency (DTMF) tones.

Where a PSTN line or cellular phone is used, the call shall be initiated using a single push button to dial the pre-programmed number. Where the Principal's communications lines are used, the call shall be initiated when the handset is picked up, or using a single push button.

6.4 Call disconnection

Where handsets are provided, the call shall disconnect when the handset is returned to its storage position by the use of a magnetic reed switch or equivalent. The Principal's TMC operator shall be allowed to disconnect the call when the handset is not returned to its storage position for an extended period of time.

Where handsets are NOT provided, the call shall automatically disconnect after the operator in the Principal's TMC disconnects.

6.5 Automatic diagnostic reporting

Help phones shall automatically send a message to the Principal's TMC when one or more of the following conditions occur:

a) battery state below the required operating level

b) faulty switch or keypad, and

c) LED indicator conditions.

6.6 Compliance requirements

The help phone installation shall comply with the following documents:

a) AS/CA S002

b) AS/CA S003.1

c) AS/CA S003.3

d) AS/CA S004

e) AS 4262.2

f) AS/NZS 60950.1

g) AS/NZS 61000.6.1

h) AS/NZS 61000.6.3, and

i) IEC 60950-1.

7 Mechanical and physical requirements

7.1 General

The mechanical and physical requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional mechanical and physical requirements relevant under this Technical Specification are defined below.

7.2 Enclosure

All electronics, switches and the handset (where supplied) shall be installed in a cast or extruded aluminium housing. The design of the enclosure shall enable the equipment installed within the enclosure to operate in the environmental conditions specified in Clause 12.

A handset symbol, similar to that shown in the Queensland *Manual of Uniform Traffic Control Devices* (Queensland MUTCD), Part 1, shall be provided on the outer-most vertical faces of the enclosure.

All doors and openings in the help phone shall be provided with a durable and resilient weatherproof seal.

When installed, in normal service, the help phone shall provide a degree of protection of at least IP55 in accordance with AS 60529.

The enclosure shall be vermin proof, including termites, ants, bees and mice.

7.3 Handset

Where provided, the handset shall be attached to the phone using a stainless-steel, vandal-resistant, flexible cord to protect the internal wiring. The flexible cord shall be anchored within the phone body and the handset in such a manner and length that ensures the door closes and seals correctly.

The handset shall rest on an immovable cradle. The cradle shall provide easy, seating alignment of the handset when hanging up.

7.4 Front panel

A numeric keypad that is accessible to the public is not permitted. The handset or call initiation button shall be mounted on the front panel. Where a handset is provided, the front panel shall be housed behind an access door as specified below.

7.5 Access door

Where provided, the access door of the help phone shall:

a) be incorporated to provide access to the phone unit and handset

b) not open more than 180 degrees from its closed position

c) have a size as close as possible to the external dimensions of the cabinet consistent with mechanical strength requirements

d) be hinged on the left-hand side. The hinges shall not protrude from the housing, and shall not allow removal of the hinge pins, and

e) be fitted with a self-closing mechanism, to automatically force the door to remain closed when not in use.

7.6 Exterior finish

Exterior colour: Mid Blue B15 as defined in AS 2700.

Interior colour (where viewed by public): Mid Blue B15 as defined in AS 2700.

8 Electrical requirements

8.1 General

The help phone shall be capable of operating on a standard 48 (or 24) Vdc analogue phone line, mains power with battery power backup, or solar power supply.

8.2 Mains power

Where mains power is required, the relevant electrical requirements defined in Clause 10 of MRTS201 *General Equipment Requirements* and relevant requirements defined in MRTS210 *Provisions of Main Power* apply to this Technical Specification.

8.3 Battery power

Where mains power is required, also provide a battery power supply in accordance with Clause 10 of MRTS201 *General Equipment Requirements*.

8.4 Solar power

Where solar power is specified, the requirements defined in MRTS263 *Standalone Solar (PV) Power Systems* apply to this Technical Specification.

8.5 Monitoring

It shall be possible to remotely monitor the status of the phone, including all accessories including (but not be limited to) potential and actual problems with the speaker, microphone and solar power supply (where provided).

9 Installation requirements

9.1 General

The help phones and associated advisory signs shall be installed in accordance with the department's *Road Planning and Design Manual*, QGTM Part 9, and Drawing S2 of the MUTCD.

All signs associated with the help phones shall comply with the requirements of Part 6 of the Transport and Main Roads Queensland *Manual of Uniform Traffic Control Devices*.

9.2 Mounting facilities

Help phones shall be installed at the locations shown on the design documentation, using a vandal resistant mount. Where a help phone is mounted on a post, the installation shall be in accordance with QGTM Part 9, Drawing TC9799.

Solar help phones may be standalone or barrier mounted.

9.3 Pits and ducts

Cable enclosure infrastructure shall be provided in accordance with MRTS91.

9.4 Provision for connection to telecommunication lines

Provision for connection to telecommunications lines shall be provided in accordance with the requirements of ACMA. The Principal shall supply the SIM card. Cable access shall be incorporated in the help phone mounting arrangement.

9.5 Caller instructions

A weather-proof, aluminium label detailing the caller instructions for using the help phone shall be provided on the Front Panel or inside the door. The label shall display engraved, black text (minimum size 4 mm) in a sans-serif font. The label shall be fixed by a non-adhesive, vandal-resistant method.

10 Environmental requirements

The environmental requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional environmental requirements relevant to this Technical Specification are defined below:

a) The equipment shall be capable of continuous, normal operation with maximum noise conditions likely to occur at the installation site.

11 Testing and commissioning

The testing and commissioning requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

12   Documentation

The documentation requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

13   Training

The training requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

14   Maintenance

The maintenance requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

15   Handover

The handover requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

16   Compliance evaluation form

The compliance evaluation form for this Technical Specification is published on the Intelligent Transport systems and Electrical Approved Products and Suppliers webpage.