

Technical Specification

**Transport and Main Roads Specifications
MRTS221 Help Phones**

July 2017

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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 TMC to report an incident or request assistance.

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 wiring and associated equipment shall comply with the requirements of AS/NZS 3000 *Wiring Rules*.

All telecommunications equipment shall comply with relevant Australian Communications & Media Authority 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

Term	Definition
3G	Third Generation cellular telecommunications network
ACMA	Australian Communications & Media Authority
Cellular	Pertaining to a wireless telecommunications network comprising cells, such as GSM or 3G
dB(A)	Sound level measurement unit corrected for average human hearing response
DTMF	Dual-Tone Modulated Frequency
Full duplex	Ability to transmit and receive concurrently at full speed
GSM	Global System for Mobile Communications
NextG	Telstra's Next G cellular network
PABX	Private Automatic Branch Exchange
PSTN	Public Switched Telephone Network

Term	Definition
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

Document ID	Documents Name / Description
AS 2700	<i>Colour Standards for general purposes</i>
AS/NZS CISPR 22	<i>Information Technology Equipment -Radio Disturbance Characteristic – Limits and Methods of Measurement</i>
AS/NZS 3260	<i>Approval and test specification—Safety of information technology equipment including electrical business equipment</i>
AS/NZS 4117	<i>Surge Protective Devices for Telecommunications Applications</i>
AS 60529	<i>Degrees of protection provided by enclosures (IP Code)</i>
AS/NZS 60950	<i>Safety of Information Technology Equipment</i>
AS 62040.1.1	<i>Uninterruptible power systems (UPS) - General and safety requirements for UPS used in operator access areas</i>
AS 62040.1.2	<i>Uninterruptible power systems (UPS) - General and safety requirements for UPS used in restricted access locations</i>
AS 62040.2	<i>Uninterruptible power systems (UPS) - Electromagnetic compatibility (EMC) requirements</i>
AS 62040.3	<i>Uninterruptible power systems (UPS) - Method of specifying the performance and test requirements</i>
AS/ACIF S002	<i>Analogue Interworking and Non interference Requirements for Customer Equipment for Connection to the Public Switched Telephone Network</i>
AS/ACIF S003	<i>Customer Access Equipment for Connection to a Telecommunications Network</i>
AS/ACIF S004	<i>Voice Frequency Performance Requirements for Customer Equipment</i>
MRTS201	<i>General Equipment Requirements</i>
MUTCD	<i>Queensland Manual of Uniform Traffic Control Devices</i>
TRUM Manual	<i>Traffic and Road Use Management Manual</i>
RPDM	<i>Road Planning and Design Manual</i>

4 Scope

The scope of this Technical Specification includes the following:

- Supply and/or installation of help phones including equipment enclosure and mounting post.
- Supply and/or installation of supporting infrastructure including conduits, pits, static signs, solar power supplies and the like.

- Act for, and on behalf of the Principal in arranging connection of leased telecommunications services where appropriate, and
- All design, documentation, supply, installation, disconnection, removal, relocation, connection, testing and commissioning of the abovementioned works.

5 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.

6 Samples for acceptance

The requirements defined in MRTS201 apply to this Technical Specification.

7 Functional requirements

Update references to reflect changes in the layout of TRUM.

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 TRUM Manual, Volume 1, Part 9, *Section 6.1.6-2 – "Help Telephones"*.

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 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, or
2. The 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 2G/2.5G (GPRS)/ 3G or 3.5G (HSDPA)) or later generation of public cellular telephone networks. Cellular phones shall connect with the network that provides the most reliable coverage at the site. Where more than one network can provide reliable coverage to the site, connection via GSM shall be the first preference. 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.

8 Operational requirements

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

8.1 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.

8.2 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.

8.3 Call initiation at Help Phone

The help phones shall have the facility to initiate the call and dial the Principal's TMC and make 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 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.

8.4 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.

8.5 Automatic diagnostic reporting

Help phones shall automatic 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.

8.6 Compliance requirements

The help phone installation shall comply with the following documents:

- a) AS/ACIF S002
- b) AS/ACIF S003
- c) AS/ACIF S004
- d) AS/NZS CISPR 22
- e) AS/NZS 4117, and
- f) AS/NZS 60950.

9 Mechanical and physical requirements

9.1 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.

9.2 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 MUTCD, Part 1, Page 79, *Drawing S2: "Public Phone"*, 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.

9.3 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.

9.4 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.

9.5 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.

9.6 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.

10 Electrical requirements

10.1 General

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

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).

10.2 Solar power supply

Where a solar power supply is provided, it shall include a solar panel mounted 3 m above areas accessible to the public, and orientated for maximum average power output.

Batteries shall be fully sealed, rechargeable and maintenance free with a minimum lifetime of 3 years in the installed environment. They shall operate the connected load at the site continuously for 72 hours without recharge and have a continuous charge controller.

11 Installation requirements

11.1 General

The help phones and associated advisory signs shall be installed in accordance with the Main Roads Road planning and Design Manual and the Main Roads TRUM Manual, Volume 1, Part 9, *Section 6.1.6-2 – “Help Telephones”*, 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*.

11.2 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 TRUM Manual, Volume 1, Part 9, *Section 6.1.6-2 – “Help Telephones”*, Drawing TC9799.

Solar help phones can be standalone or barrier mounted.

11.3 Pits and ducts

Cable enclosure infrastructure shall be provided in accordance with MRTS91.

11.4 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.

11.5 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.

12 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) maximum noise conditions likely to be occur at the installation site.

13 Testing and commissioning

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

14 Documentation

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

15 Training

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

16 Maintenance

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

17 Handover

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

