

# Main Roads Technical Standard

## **MRTS221**

### **Provision of Help Telephones**

**October 10**

## **TRADEMARKS ACKNOWLEDGEMENT**

Terms mentioned in this document that are known or understood to be trademarks, whether registered or not, have been identified. Where trademarks have been confirmed as registered in Australia, this has been indicated by the addition of the ® symbol, otherwise the ™ symbol is used. While all care has been taken to identify trademarks, users should rely on their own inquiries to determine trademark ownership. Use of a term in this document as a trademark should not be regarded as affecting the validity of any trademark.

## **IMPORTANT INFORMATION**

The requirements of this document represent Technical Policy of the department and contain Technical Standards. Compliance with the department's Technical Standards is mandatory for all applications for the design, construction, maintenance and operation of road transport infrastructure in Queensland by or on behalf of the State of Queensland.

This document will be reviewed from time to time as the need arises and in response to improvement suggestions by users. Please send your comments and suggestions to the feedback email given below.

## **FEEDBACK**

Your feedback is welcomed. Please send to [mr.techdocs@tmr.qld.gov.au](mailto:mr.techdocs@tmr.qld.gov.au).

## **DISCLAIMER**

This publication has been created for use in the design, construction, maintenance and operation of road transport infrastructure in Queensland by or on behalf of the State of Queensland.

Where the publication is used in other than the department's infrastructure projects, the State of Queensland and the department gives no warranties as to the completeness, accuracy or adequacy of the publication or any parts of it and accepts no responsibility or liability upon any basis whatever for anything contained in or omitted from the publication or for the consequences of the use or misuse of the publication or any parts of it.

If the publication or any part of it forms part of a written contract between the State of Queensland and a contractor, this disclaimer applies subject to the express terms of that contract.

## **COPYRIGHT**

Copyright protects this publication. Except for the purposes permitted by and subject to the conditions prescribed under the Copyright Act, reproduction by any means (including electronic, mechanical, photocopying, microcopying or otherwise) is prohibited without the prior written permission of the department. Enquiries regarding such permission should be directed to the Pavements, Materials, Geotechnical and Standards Division, Queensland Department of Transport and Main Roads.

© State of Queensland (Department of Transport and Main Roads) 2010



<http://creativecommons.org/licences/by-nc-nd/2.5/au>

# Table of Contents

	Page
1 INTRODUCTION.....	1
2 STANDARD SPECIFICATIONS .....	1
3 REFERENCE DOCUMENTS.....	1
4 DEFINITION OF TERMS .....	2
5 SCOPE.....	2
6 QUALITY SYSTEM REQUIREMENTS.....	3
7 SAMPLES FOR ACCEPTANCE .....	3
8 FUNCTIONAL REQUIREMENTS .....	3
9 OPERATIONAL REQUIREMENTS.....	3
9.1 Automatic Volume Control.....	3
9.2 Call Answering at Help Phone.....	3
9.3 Call Initiation at Help Phone .....	4
9.4 Call Disconnection.....	4
9.5 Compliance Requirements .....	4
10 MECHANICAL AND PHYSICAL REQUIREMENTS .....	4
10.1 General.....	4
10.2 Enclosure .....	4
10.3 Handset.....	4
10.4 Front Panel.....	5
10.5 Access Door.....	5
10.6 Exterior Finish .....	5
11 ELECTRICAL REQUIREMENTS .....	5
11.1 General.....	5
11.2 Solar Power Supply.....	5
12 INSTALLATION REQUIREMENTS.....	5
12.1 General.....	5
12.2 Mounting Facilities .....	5
12.3 Pits and Ducts .....	5
12.4 Provision for Connection to Telecommunication Lines.....	6
12.5 Caller Instructions .....	6
13 ENVIRONMENTAL REQUIREMENTS .....	6
14 TESTING & COMMISSIONING .....	6
15 DOCUMENTATION.....	6
16 TRAINING .....	6
17 MAINTENANCE .....	6
18 HANDOVER .....	6



# Provision of Help Telephones

## 1 INTRODUCTION

This standard defines the design, supply, installation, testing and commissioning, performance, documentation, training and maintenance requirements for help telephones.

The help telephones shall be installed on the roadside to enable motorists to contact the Principal's TMC to report an incident or request assistance.

## 2 STANDARD SPECIFICATIONS

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.

This specification shall be read in conjunction with Main Roads Standard Specifications and Main Roads Standard Drawings, including MRTS01 *Introduction to Technical Standards* and MRS50 *Specific Quality System Requirements*.

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.

## 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 standard. Where there are inconsistencies between this standard and the referenced MRTS documents, the requirements specified in this standard shall take precedence.

**Table 3 – Referenced Documents**

Document ID	Documents Name / Description
AS 2700	Colour Standards for general purposes
AS/NZS CISPR 22	Information Technology Equipment -Radio Disturbance Characteristic –Limits and Methods of Measurement
AS/NZS 3260	Approval and test specification—Safety of information technology equipment including electrical business equipment
AS/NZS 4117	Surge Protective Devices for Telecommunications Applications
AS 60529	Degrees of protection provided by enclosures (IP Code)
AS/NZS 60950	Safety of Information Technology Equipment
AS 62040.1.1	Uninterruptible power systems (UPS) - General and safety requirements for UPS used in operator access areas
AS 62040.1.2	Uninterruptible power systems (UPS) - General and safety requirements for UPS used in restricted access locations
AS 62040.2	Uninterruptible power systems (UPS) - Electromagnetic compatibility (EMC) requirements

<b>Document ID</b>	<b>Documents Name / Description</b>
AS 62040.3	Uninterruptible power systems (UPS) - Method of specifying the performance and test requirements
AS/ACIF S002	Analogue Interworking and Non interference Requirements for Customer Equipment for Connection to the Public Switched Telephone Network
AS/ACIF S003	Customer Access Equipment for Connection to a Telecommunications Network
AS/ACIF S004	Voice Frequency Performance Requirements for Customer Equipment
MRTS201	General Equipment Requirements
TRUM Manual	Main Roads Traffic and Road Use Management Manual
RPDM	Main Roads Road Planning and Design Manual

#### **4 DEFINITION OF TERMS**

The terms defined in MRTS201 *General Equipment Requirements* apply to this standard. Additional terminology relevant under this standard are defined in Table 4 below.

**Table 4 Definitions**

<b>Term</b>	<b>Definition</b>
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
Vdc	Volts (Direct Current)
TMC	Traffic Management Centre

#### **5 SCOPE**

The scope of this 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;
- All design, documentation, supply, installation, disconnection, removal, relocation, connection, testing and commissioning of the abovementioned works

## 6 QUALITY SYSTEM REQUIREMENTS

The quality system requirements defined in MRTS201 *General Equipment Requirements* apply to this standard. Additional quality system requirements relevant under this standard 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.

## 7 SAMPLES FOR ACCEPTANCE

The requirements defined in MRTS201 apply to this standard.

## 8 FUNCTIONAL REQUIREMENTS

The help telephones 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 telephone, or the operator in the Principal's TMC. The help telephones shall be provided to operate in accordance with TRUM Manual, Section 2.1 – "Emergency Telephones".

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

1. the Principal's private copper communication lines. The help telephone shall be allocated a standard PABX extension number. The help telephone shall be capable of autodialing a specified internal extension number associated with the PABX at the Principal's TMC; or
2. the PSTN. The help telephone shall be allocated a standard 10-digit telephone number. The help telephone shall be capable of autodialing 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 telephone shall be allocated a standard 10-digit telephone number. The help telephone shall be capable of autodialing 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.

## 9 OPERATIONAL REQUIREMENTS

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

### 9.1 *Automatic Volume Control*

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

### 9.2 *Call Answering at Help Phone*

The help telephone 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.

### **9.3 Call Initiation at Help Phone**

The help telephones shall have the facility to initiate the call and dial the Principal's TMC and make a connection. The telephone number of the operator in the Principal's TMC shall be able to be stored in the telephone 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.

### **9.4 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.

### **9.5 Compliance Requirements**

The help telephone 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.

## **10 MECHANICAL AND PHYSICAL REQUIREMENTS**

### **10.1 General**

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

### **10.2 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 TRUM Manual, Section 2.1 – "Emergency Telephones", Drawing GE7-6, shall be provided on the outer-most vertical faces of the enclosure.

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

When installed, in normal service, the help telephone 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.

### **10.3 Handset**

Where provided, the handset shall be attached to the telephone using a stainless-steel, vandal-resistant, flexible cord to protect the internal wiring. The flexible cord shall be anchored within the telephone 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.

#### **10.4 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.

#### **10.5 Access Door**

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

- a) be incorporated to provide access to the telephone 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.

#### **10.6 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.

### **11 ELECTRICAL REQUIREMENTS**

#### **11.1 General**

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

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

#### **11.2 Solar Power Supply**

Where a solar power supply is provided, it shall include a solar panel mounted 3m 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.

### **12 INSTALLATION REQUIREMENTS**

#### **12.1 General**

The help telephones and associated advisory signs shall be installed in accordance with the Main Roads Road planning and Design Manual and the Main Roads TRUM Manual, Section 2.1 – “Emergency Telephones.

All signs associated with the help telephones shall comply with the requirements of part 8 of the Main Roads Manual of Uniform Traffic Control Devices.

#### **12.2 Mounting Facilities**

Help telephones shall be installed at the locations shown on the design documentation, using a vandal resistant mount. Where a help telephone is mounted on a post, the installation shall be in accordance with TRUM Manual, Section 2.1 – “Emergency Telephones”, Drawing TC9799.

#### **12.3 Pits and Ducts**

Cable enclosure infrastructure shall be provided in accordance with MRTS91.

#### **12.4 Provision for Connection to Telecommunication Lines**

Provision for connection to telecommunications lines shall be provided in accordance with the requirements of ACMA. Cable access shall be incorporated in the help telephone mounting arrangement.

#### **12.5 Caller Instructions**

A weather-proof, aluminium label detailing the caller instructions for using the help telephone 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.

### **13 ENVIRONMENTAL REQUIREMENTS**

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

- a) maximum noise conditions likely to occur at the installation site;

### **14 TESTING & COMMISSIONING**

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

### **15 DOCUMENTATION**

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

### **16 TRAINING**

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

### **17 MAINTENANCE**

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

### **18 HANDOVER**

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