

LEVEL CROSSING ALARMS: POLICY ON THE INSTALLATION OF QUIET BELLS

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1. INTRODUCTION

Quiet bells have been used at a small number of installations for some years in situations where the normal bells are considered to be environmentally unfriendly. The usual reason for reducing the sound level was to limit the exposure of night time noise to adjacent residential properties. The traditional railway electromagnetic bell was not a success when installed as a quiet bell. Suitable electronic quiet bells are now available which can be adjusted to either provide normal or reduced sound levels to a quiet bell sound level specification. Quiet bells are sometimes referred to as "soft tone" bells.

2. NIGHT SWITCHING OF BELLS

Until recently, the preferred method of limiting noise at night was to switch the standard bells off at night (usually referred to as "night switching") so that they did not operate between the hours of 10:30pm and 7:00am. If half arm barriers are installed, the bells operate on commencement of alarm operation until the barrier arms have fallen to the lowered position so that any pedestrians or cyclists were given an audible warning of a barrier descending. This short period when the bells continue to operate at night has resulted in some complaints mainly from new residents who are unaware of this feature. A recent pedestrian fatality at a suburban crossing where the bells were switched off has highlighted the additional risk of switching the bells off at night.

3. CURRENT POLICY FOR LIMITING OF NOISE

The installation of quiet bells is the current recommended and preferred method when reduced sound levels are required for environmental reasons. They have the advantage that an audible warning is always provided when the alarms operate. Note that quiet bells are also of benefit when there is a need to reduce sound levels during the day to avoid disturbance to adjacent facilities such as school classrooms.

4. CRITERIA FOR THE INSTALLATION OF QUIET BELLS OR THE NIGHT SWITCHING OF BELLS

A written request or agreement is required from the territorial authority before quiet bells will be installed or controls installed for night switching of existing bells. The territorial authority is considered to represent the best interests of the local road users and is likely to be aware of any special reasons which may make the installation of quiet bells at a particular location unsafe.

Recent experience indicates that most territorial authorities are now reluctant to support the night switching of bells and are generally prepared to support the installation of quiet bells.

It is now current Tranz Rail policy to discourage night switching of bells because such activity is considered to not be in line with current international safety recommendations and practices (see also section 6). Tranz Rail will consider the replacement of night switching with quiet bells at any particular installation if requested by the Territorial Authority.

5. SPECIFICATION OF SOUND LEVELS

The American Railroad Engineering & Maintenance of Way Association (AREMA) Manual specifies the following peak sound levels at 3.0 m (measured in an anechoic test chamber at the same height as the bell):

Normal bell:	Maximum 105 dBA;	Minimum 85 dBA.
Quiet bell:	Maximum 85 dBA;	Minimum 75 dBA.

Bells to these standards have been purchased for use on the NZ rail network for many years.

All bells are tested and adjusted to meet this specification before installation and rechecked on site for minimum sound levels if special circumstances exist.

6. INTERNATIONAL PRECEDENTS

NZ has generally followed North American practice for level crossing alarm protection. The US Department of Transportation has recently issued revised standards in the form of their *Manual of Uniform Traffic Control Devices (MUTCD)*. Recommended practice is to always have some audible warning to pedestrians even if the main level crossing bells are switched off once the barriers are down. The use of quiet bells instead of night switching in NZ aligns with this recommendation.

US practice also allows bells to be omitted when there is no evidence of pedestrian activity.

7. RECENT INSTALLATIONS OF QUIET BELLS

Electronic quiet bells have been installed as a part of the alarm installation at the following locations:

- Breakwater Rd (SH50) , Ahuriri, Napier
- Manor Park, Hutt Valley
- Plimmerton Station pedestrian crossing
- George St, Kingsland, Auckland
- Pedestrian crossing by freezing works, Maitua
- James Line, between Palmerston North and Ashurst.
- Buller Rd (SH 69), Reefton

Complaints concerning these installations are minimal.

The new electronic bells used direct the sound downwards and thus limit the spread of the sound waves.

AEC Neilson

MANAGER SIGNALS TELECOMMUNICATIONS & ELECTRICAL ENGINEERING