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A COMPARISON OF MEASURED REVERBERATION TIMES IN FURNISHED AND UNFURNISHED CLASSROOMS

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1 INTRODUCTION

The revised acoustic performance standards for schools now allow for reverberation time testing to be carried out in rooms which are furnished for normal use. However, when carrying out acoustical calculations or modelling to predict the reverberation time within a teaching space it can be difficult to accurately account for the effect of the furniture. Furthermore, it is often desirable for the contractor to carry out pre-completion testing to demonstrate compliance with the standards before rooms are fully furnished. It is, therefore, often necessary to undertake testing in unfurnished rooms, meaning that the results cannot be directly compared to the criteria contained within BB93.

As far as the authors are aware, there are limited publicly available data regarding the effect of furniture on the measured reverberation time within classrooms.

The intention of this paper is, therefore, to provide a set of test data from which appropriate corrections to reverberation times measured in unfurnished rooms can be derived. Measurements have been carried out within several classrooms of different shapes and sizes and including varying degrees of acoustic treatments, in both furnished and unfurnished conditions, with the results compared.

2 BACKGROUND

The recently published 'Acoustic Design of Schools: Performance Standards (BB93)[1] contains the standards which should be followed when designing new school buildings. One of the design areas covered in the document is reverberation times, and criteria are included for a range of different teaching and learning spaces.

The required reverberation time specified in BB93 is known as a T_{mf} (mid-frequency reverberation time); this is the arithmetic average of the reverberation time within the 500 Hz, 1 kHz and 2 kHz octave bands, or the third octave bands between 400 Hz and 2.5 kHz. Table 1 below includes a selection of reverberation times for different types of spaces.

Table 1: BB93 reverberation time criteria

Room / Space	Upper limit for mid frequency reverberation time (T_{mf}), seconds
Primary school classroom	0.6
Secondary school classroom	0.8
Library	1.0
Drama studio	1.0
Gymnasium / activity studio	1.5