2:50

7AA4. Low-frequency resonances in glazing configurations. Gregory C. Tocci (Cavanaugh Tocci Associates, Inc., 327F Boston Post Rd., Sudbury, MA 01176)

Stiffness combinations of insulating and laminated glass often result in resonances that reduce glazing configuration sound transmission loss. Among these are mass–air–mass and mass–damping material–mass stiffness resonances. Several resonances and their effect on sound transmission class (STC) and outdoor–indoor transmission class (OITC) will be discussed. [Work partly supported by Monsanto.]

Contributed Papers

3:15

7AA5. Development of Standard Guide ASTM E 966, "Field measurement of facade sound isolation." Angelo J. Campanella (Campanella Associates, 3201 Ridgewood Dr., Columbus, OH 43026)

Standard Guide ASTM E 966-84 (similar to ISO 140/5) describes *in situ* field methods of measuring the ability of windows and doors to prevent the penetration of environmental noise into a room. Recent ASTM review for reapproval resulted in more explicit method options and descriptions. Six different ways are now available where noise reduction and sound transmission loss can be measured, each distinguished by the way that the external sound field is created and measured. The user determines which of these techniques is best suited to his or her field situation. *In situ* sound fields are unidirectional (single loudspeaker or point source) or quasidiffuse (traffic or flying aircraft), whereas that in the two-room laboratory methods is diffuse. Three options for measuring the incident sound level are: flush, around 2-m distance (as in ISO 140/V-3.1 using traffic), and remote free-field at an equivalent distance (as in ISO 140/V-4.1 using a loudspeaker). Sound transmission loss values are adjusted for comparison with E 90 or ISO 140/III laboratory results. Point source adjustment is according to the cosine of the angle of incidence. Line source adjustment is by the "average cosine" [P. T. Lewis, J. Sound Vib. **33**, Pt. 3, 127–141 (1974)], but *x*-, *y*-, and *z*-site dimensions are converted to elevation angle and included azimuthal angle of the traffic line as seen from the test facade. The six methods are compared with other FHWA and FAA methods in common use.

3:30

7AA6. Reduction of plumbing noise in lightweight construction. A. C. C. Warnock (Natl. Res. Council Canada, Montreal Rd., Ottawa, Ontario K1A 0R6, Canada) and M. J. Morin (MJM Acoust. Consultants Inc., Montreal, Quebec H3S 2A6, Canada)

Noise from plumbing fixtures can be a source of great annoyance in single-family and multi-family homes. Noise-control articles and textbooks usually recommend the use of resilient supports for pipes and other fixtures as a means of controlling noise. A study recently completed at NRC examined the changes in noise level produced by different types of pipe, different methods of mounting pipes, different wall types, and the addition of sound absorbing materials in walls. Noise sources used included an ISO standard plumbing noise source, a toilet, a sink, and five common bathroom faucets. Closed cell foam rubber supports were found to be the most effective of the resilient materials tested, providing reductions in A-weighted noise levels of around 20 dB. This paper will give a summary of the results obtained. [The study was funded by Canada Mortgage and Housing Corporation.]

3:45

7AA7. Sound transmission through very porous concrete blocks. A. C. C. Warnock (Natl. Res. Council Canada, Montreal Rd., Ottawa, Ontario K1A 0R6, Canada)

Sound transmission loss measurements through a wall constructed from very porous concrete blocks gave some interesting results. The unfinished block wall had a sound transmission class (STC) rating of 14. This was increased to only 29 by screwing a layer of drywall to one side of the block wall. The drywall, while it provides a sealed surface, is not well enough bonded to the blocks and can still vibrate fairly freely. Plastering increased the STC to 43. The porosity of the block increased the effective depth of the air space behind the drywall. This lowered the mass-air-mass resonance substantially and, with drywall supported on steel studs, plastered block wall systems gave very good STC ratings. Walls constructed using this type of block can give STC ratings about as high as those obtained with heavier normal weight blocks. Measurements were made down to 63 Hz and revealed that in many cases there are resonances occurring below 125 Hz that have a strong influence on transmission loss values at and above 125 Hz. Measurement to these low frequencies give a clearer picture of the effect of changes to the wall structure. The results obtained will be presented and discussed.

4:00

7AA8. Suggested infrasound criteria for building spaces. Gregory C. Tocci (Cavanaugh Tocci Associates, Inc., 327F Boston Post Rd., Sudbury, MA 01776)

Work by Leo L. Beranek ["Application of NCB Noise Criterion Curves," Noise Control Eng. J. (Sept.–Oct. 1989)] presents and discusses a set of "balanced noise criterion curves." These are cited as an improvement in the widely used NC curves and extends them down to the 16- and 31.5-Hz octave bands. These curves are steeply sloped in the very low-frequency range and are intended to be based wholly on audibility. The author draws upon his experience and a paper by H. Dawson ["Practical Aspects of the Low Frequency Noise Problem," J. Low Freq. Noise Vib. **1** (1) (1982)] to arrive at a modified set of NC curves extending down to 16 Hz that combine audibility and feelability affects. Examples of the application of these suggested criteria curves will be discussed.