

ACOUSTICS2008/2155
**Renovation of the concert hall The Doelen: A case study on the
impact of a stage canopy on stage and room acoustics**

Margriet Lautenbach^a, Martijn Vercammen^b and Klaus-Hendrik Lorenz-Kierakiewitz^c

^aPeutz BV, PO Box 696, 2700 AR Zoetermeer, Netherlands

^bPeutz, De Grippen 1124, 6605 TA Wijchen, Netherlands

^cPeutz BV, Kolberger Strasse 19, D-40599 Duesseldorf, Germany

When opened in 1966, the main concert hall in De Doelen, Rotterdam, the Netherlands, was provided with six canopies above the stage platform. Their function was twofold:

- to provide a large part of the audience with early reflections;
- to create good ensemble conditions for the musicians on stage.

Despite good reviews after the opening, a few years later the canopies were removed to get rid of unwanted reflections at the recording microphones positions just below the canopy. Since then, a significant percentage of the orchestra is unhappy about the acoustic conditions on stage. During the design process of the renovation, possibilities to re-introduce a stage canopy are investigated. Objective acoustic parameters obtained by carrying out measurements in the hall as well as in a 1:10 scale model and by calculations with a ray-tracing computer model are examined. Parallel, three questionnaire rounds gave an impression about the musicians' subjective judgement about the stage acoustics.

In this paper the acoustic differences of three situations (without canopy, with original canopies and with new canopy design) and the search for an optimal balance between improving the stage acoustics without altering room acoustical conditions in the audience are discussed.