The sound barrier

The acoustic design of Leicester's 'inside-out' theatre, Curve, had to enable simultaneous performances in two back-to-back spaces sharing a common stage

Right: Curve's 750-seat Auditorium

Below: Curve's foyer is a performance space in its own right

The brief for Curve, the new theatre in Leicester, UK, asked for an open theatre concept (coined 'theatre inside-out') breaking with the traditional boundaries between front and back of house, and allowing performances to occur almost anywhere in the building. The initial architectural concept proposed a grid spanning the entire building, with theatres as open islands under a common roof, separated by mobile acoustic curtains. To optimise the technical and staging possibilities, the stage then shifted to the centre of the building, opening up onto both the larger 750-seat Auditorium and the smaller, 350-seat Black Box.

Parallel performances

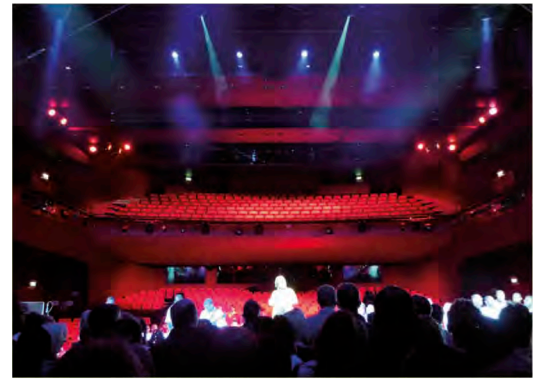
The acoustic design – by Kahle Acoustics – started with the question of how much (and when) acoustic isolation is really required. Parallel performances (and rehearsals) had to be possible in the Auditorium and the Box, despite both spaces sharing a common stage. "An interesting outcome of the studies and discussions with theatre staff was that only moderate acoustic isolation is required between the stage and foyer during performances – as long as noisy activities in the foyer can be kept away from the vicinity of the stage house," says Eckhard Kahle, acoustician at Kahle Acoustics. "On other occasions, the foyer becomes part of the show, making acoustic isolation obsolete."

Initially, the acoustic isolation between the stage house and the foyer was achieved solely with two sets of multilayered soft curtains. These were eventually replaced with a single layer of shutters that move vertically. The fire-resistant, relatively lightweight shutters achieve an acoustic isolation of 38dB between the stage house and the foyer. A single 40dB safety curtain separates the stage from the Auditorium, while the separation to the Box is achieved with double shutters. To avoid structural sound transmission, the Auditorium and the Box are fully structurally separated above grade from each other, and from the roof, which includes most technical equipment.

The Auditorium is a one-balcony theatre with a squared-off horseshoe shape and acoustically optimised sidewall and ceiling reflectors. The Box features fully flexible seating and a full grid over the entire space allowing the placement of the stage anywhere in the room, in addition to the option of opening the Box onto the main stage. A fixed balcony and technical catwalks on three sides are used for improved acoustic reflections.

Surrounding the theatres on all sides, the foyer is regularly used for performances, as well as pre- and post-performance activities. With its two bars, it is open to the public every day. Significant acoustic absorption was provided to create good acoustic conditions and reduce noise spreading. The 22m-tall, partially slanted glass façade achieves an acoustic isolation of 40dB to the outside. Kahle Acoustics says that in the foyer, buses passing by can be faintly heard, as well as amplified shows on the main stage, but out on the street, activity in the theatre cannot be heard, and inside the auditoria not a single intrusive noise from the street or foyer can be heard.

Since its opening in 2008, Curve is being used with promising results. The opening show crew made good use of the stage shutters even during set-up and rehearsal, praising the ability to rehearse in natural daylight. "The vision of the inside-out theatre has been successfully materialised into Curve's day-to-day operations," says Kahle. ■



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