

# Swiss precision

Simon Duff reports on the renovation and acoustic upgrade of the Théâtre de Beaulieu, Lausanne . . .

**[Switzerland]** Situated in the picturesque city of Lausanne, Théâtre de Beaulieu is the largest theatre in Switzerland. Originally opened in November 1954, its vast foyer boasts panoramic views of the city, Lake Geneva and the mountains beyond. Owned by Beaulieu SA, the theatre has a seating capacity of some 1,600, with the main hall hosting drama, theatre, dance and musicals, along with both amplified and non-amplified music concerts. The latter includes operas and symphonic concerts, such as a series by Orchestre de la Suisse Romande and the Orchestre de Chambre de Lausanne.

In 2015 it was decided that renovation and a building upgrade were needed to refresh the site. The tender went to Fehlmann Architects of Lausanne, while Thierry Guignard of France was awarded theatre planning and Belgium's Kahle Acoustics was appointed to conduct an acoustic investigation, and handle construction supervision and acoustic commissioning of the hall. The Kahle Acoustics team included Yann Jurkiewicz and company founder Eckhard Kahle.

Two build phases began in 2017, with work finally completed in 2022. The building's sensitive renovation and upgrade includes the design of a new acoustically optimised orchestra shell and the integration of an Amadeus Active Acoustics system, enabling the hall's acoustical resonance to be adapted to unamplified content if required, and to enhance natural acoustic reverberation. Various acoustic improvements have been achieved through the renovation of the theatre, its new orchestra shell and wooden ceiling, its active acoustic enhancement system and its improved acoustic isolation.

The Kahle Acoustics team began work on the Théâtre de Beaulieu project in early 2016. Yann Jurkiewicz explains the

thinking behind the acoustic upgrade: "The previous acoustics were not bad, but some serious issues needed to be solved. First, there was a real acoustic isolation problem; when inside the theatre, one could hear a lot of unwanted outside noise sources. The roof was also very weak, with rain or wind being clearly audible inside. The internal noise, generated by the technical installations, was also problematic. Proper silence is an absolute prerequisite for good acoustics."

He continues: "The other important acoustic problem was the lack of air volume inside the theatre. For a classical music concert, a rich and enveloping sound can only be obtained in a sufficiently large space. But the previous ceiling was too low to allow acoustic reverberation to develop. That's why the new ceiling was built as high as it could be, without changing the roof height. And because that was still not enough, we also installed an active acoustic enhancement system."

A further issue involved the Stage Tower at the venue. Very high and filled with draperies and technical equipment that muffled the natural sound of the instruments, it was not an appropriate acoustical environment for an orchestra. Previously, a lightweight stage shell made from stretched PVC sheeting had to be installed for each orchestral concert. This was both time-consuming and impractical for the Beaulieu technical team, and not acoustically satisfactory for the musicians. Changing that orchestra shell for a more practical and better-sounding arrangement was one of the important goals of the renovation.

Jurkiewicz's first role was to assess the acoustics of the previous state of the theatre: what was good and what needed to be improved? This was done through acoustic measurements of objective criteria, but also by listening to



Photo: Fehlmann Architects

concerts in the theatre and building a subjective but professionally informed opinion on the acoustics of Beaulieu. Advice was given to the architects and the client on how to refurbish the theatre in order to improve its acoustics. Jurkiewicz's role was to make sure that the transition was as smooth as possible, verifying that everything was built as intended, with the right acoustic behaviour.

The ability to change the acoustics has been realised with the use of an Amadeus Active Acoustics electroacoustic system. Allowing the required

*"Proper silence is an absolute prerequisite for good acoustics . . ."*

- Yann Jurkiewicz

reverberation, fullness of tone and musical blend for full symphony orchestra concerts, it can be tamed down to a more intimate acoustic setting for chamber music concerts, or switched off completely for amplified events, when clarity of sound needs to prevail. The Amadeus system loudspeakers include: 30 Amadeus Audio C6s, eight C15s and six PMX15s, plus 18 Biamp Desono D6s. The system employs microphones including: 18 DPA SC4098s, six DPA 4060s, plus eight Sennheiser MKH 8060s. Amadeus Active Acoustics provided and programmed the main processing engine.

The theatre's main PA system has also been upgraded. L-Acoustics has been the venue's preferred solution for some time, and the new install brings the system up-to-date, based around 24 Kara 11s, 10 SB-18s and eight 5XTs, driven by 10 LA4X amplified controllers. Audio consoles include Yamaha CL5 and Soundcraft Vi14.

Adding to the range of kit on offer, stage production microphones include top-of-the-range models from Neumann, Sennheiser, DPA, AKG and Shure. The audio installation was carried out by Hyperson, a leading Swiss audio rental and solutions integrator, with Fabian Schild as project manager.

Room acoustic measurements were made during the tuning period in September 2022. Jurkiewicz adds: "The reverberation time is now 1.4s at mid frequencies for the hall with no audience, but with the orchestra shell installed on stage. This is the passive value for the hall, when the active acoustic system is switched off. The Kahle team then defined a standard chamber orchestra mode, for which the reverberation time reaches 1.8s in the same conditions - empty hall, with orchestra shell - and a standard symphony orchestra setting for which reverberation time reaches 2.0s.



Photo: Fehlmann Architectes

"The reverberation loudness is increased by approximately 1dB in this symphony orchestra mode, compared to the passive setting, while it is increased by 2dB in the chamber orchestra mode. The symphony orchestra setting then has a longer reverberation but at a lower level than in the chamber orchestra setting, which is equivalent to simulating the acoustics of a larger space."

With the renovation having quite literally raised the roof, Théâtre de Beaulieu reopened its doors to the public in September 2022. Sensitively handled, the works have preserved the identity of the venue, while improving the listening experience for both audiences and performers.

➔ [www.kahle.be](http://www.kahle.be)  
➔ [www.amadeus-acoustics.com](http://www.amadeus-acoustics.com)

**DIGITAL PROJECTION**  
A Delta Group Company



TRULY EXCEPTIONAL  
COLOURS + TECHNOLOGY + IMAGES

WUXGA - 4K - 8K - MultiView

Satellite Projection Heads and RGB Modular Light Sources



- [www.digitalprojection.com](http://www.digitalprojection.com) -

The Visionaries' Choice