

Auditoria

Annual 2014

Inside:

Jean Nouvel's €387m Philharmonie de Paris

Zorlu Center: Broadway to the Bosphorus

Interior motives at Long Beach Arena

**Terry Pawson's dynamic
jewel for Linz**

Multi-talented

Inside Wolf D. Prix's parametric masterpiece, the
Dalian International Conference Center



Extraordinary acoustics

Renovations to the Felsenreitschule Salzburg have seen the stunning historical hall enhanced with modern amenities and state-of-the-art acoustics

(Main) **The Felsenreitschule has a capacity for 1,438 audience members**
(Below) **The modernised configuration of the hall**

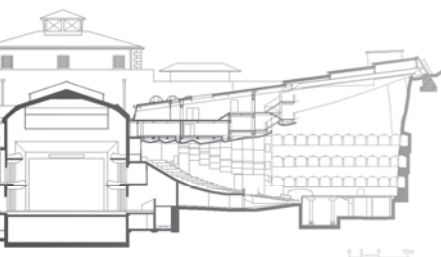
The Felsenreitschule in Salzburg is an extraordinary opera house. The stage's rear wall is a rock with three walkways carved in behind arcade columns. In the 17th century, the Bishop of Salzburg had his master builder, Fischer von Erlach, build this impressive venue for hunting animals and exercising horses. Since theatre director Max Reinhardt discovered the venue in the 1920s, generations of conductors, musicians and theatre directors have been fascinated by the individual character of the large stage. The Salzburg Festival had already been using the venue for major theatre productions for 20 years when Herbert von Karajan realised it could also host opera and concert performances.

Originally the building didn't have a roof, but the inevitable Salzburg summer rain forced the

festival management to build a canopy for the audience. Major renovation works in the 1970s extended this asset to the stage area, in the form of an extendable foil roof. Thus, the venue could be used as an open-air stage or as a roofed opera house. Since the foil roof was not suitable for bearing the weight of snow, it was necessary to open it up in late autumn and just let the winter snow cover the stage.

The venue's acoustics have also been modernised over the years, with the last major works in 2006 seeing improvements in the upper audience area as the balconies were removed and replaced with a smooth raking of seats. Despite its huge 20,000m³ volume, the hall's acoustical performance has earned it quite a reputation.

In 2010, the organisers of the Salzburg Festival decided to install a roof that could remain closed





in the winter. Furthermore, they felt that the stage scenery and lighting should be improved. The architects of Halle1 in Salzburg proposed a sophisticated solution with telescopic beams bearing movable roof elements. The acoustical disadvantages of the new lighting bridges and the resulting increase in the hall's volume to about 23,000m³ – double the volume of a traditional opera house – would be compensated by a new wall and ceiling structure enclosing the audience.

Specialised sound

In addition to supporting the volume of the singers and orchestras, the acoustics needed to envelop the audience, merging individual orchestra instruments into an ensemble, without affecting the music's clarity or transparency. Based on several multichannel acoustical measurements in the occupied and unoccupied hall, Müller-BBM created an acoustical computer



ACOUSTICS

model. With this and numerous laboratory measurements, the absorption and sound-directing properties of all new surfaces in the hall were defined and optimised.

To adjust the acoustics for individual productions, Müller-BBM also installed Vivace, an electro-acoustic room-enhancement system that enables the acoustics to be supplemented with additional sound, as required. This way, excellent acoustics are guaranteed to complement the top-class artistic performances at the Salzburg Festival. ■

The stage is 40m wide and 25m deep

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