

Twin peaks

Concert halls in Andermatt and St Christoph am Arlberg have both been acoustically optimised to attract the world's greatest musicians to the Alps

When asked at its opening if Andermatt Concert Hall in Switzerland was the highest concert hall in Europe, Eckhard Kahle joked that the record was actually held by another of Kahle Acoustics' projects in St Christoph am Arlberg, Austria. The founder and managing director of Kahle Acoustics was right – with Andermatt lying at an altitude of 1,430m (4,692ft), the Austrian hall beats it by nearly 400m (1,312ft). Nevertheless, as the Berlin Philharmonic Orchestra struck the opening notes of Mozart's *Symphony No. 34 in C Major*, any disappointment at losing the altitude contest was soon dispelled.

Andermatt Concert Hall opened in June 2019 after a rapid design and construction programme that began in early 2018. At that point the concert hall was still a concrete bunker next to a hotel being financed by Samih Sawiris, an Egyptian developer and long-time classical music lover. Sawiris' passion for music was sparked during his time as a student in Berlin, Germany, attending concerts by the Berlin Philharmonic Orchestra.

Raise the roof

The space was originally intended to become a 7m (23ft)-tall conference room. However, Sawiris saw the potential to convert the unprepossessing bunker into a world-class concert hall. Studio Seilern Architects, acoustics firm Kahle Acoustics and theatre consultants Ducks Scéno were brought on board. After analysing a number of designs that retained the existing 2,000m³

(70,629ft³) concrete shell, the architects proposed to raise the roof, more than doubling the volume to 5,000m³ (176,573ft³). This enabled the introduction of a wrap-around balcony, increasing the capacity to nearly 700 seats, while also flooding the hall with daylight. With views to the mountains, the audience is surrounded by swirling snow in the winter and sunshine in the summer.

Sawiris aspired to attract the world's top orchestras and to establish a programme of classical music festivals in collaboration with the Lucerne Festival. Therefore it was

clear that this should be a hall where orchestras and chamber music ensembles – more used to performing in much larger halls – would feel perfectly comfortable. The challenge for the designers at Kahle Acoustics was therefore to create the impression of a large hall and produce a grown-up acoustic for orchestras whose home concert halls count among the very best in the world.

Andermatt Concert Hall has a volume of 5,000m³ (176,573ft³) and its stage accommodates up to 75 musicians

Familiar territory

Providing a familiar stage environment for the musicians was key. The hall has a somewhat unorthodox arrangement, with the stage along the long wall of the hall. This was driven both by the aim to accommodate orchestras of up to 75 musicians and the necessity to retain a fire access road at ground level. In this configuration the hall is 25m (82ft) wide and has balconies extending alongside the stage. "The physical and acoustical situation will be familiar to ensembles coming from the KKL Lucerne in Switzerland,

At Andermatt Concert Hall, the audience feels embedded in the landscape, while passers-by outside experience the suspended acoustic reflectors as floating sculptures





ST CHRISTOPH AM ARLBERG

Lying at an altitude of 1,800m (5,906ft) above sea level in the Tirol mountains in Austria, the concert hall in St Christoph am Arlberg is the highest in Europe. Opened in 2015, the 200-seat chamber music hall forms part of a 700m² (7,535ft²) arts complex nestled into the mountain side. Young artists had been invited to residencies in Arlberg since 2008. The arts centre and concert hall now provides dedicated spaces for artists and musicians to work, exhibit and perform.

In collaboration with Kahle Acoustics, architect Jürgen Kitzmüller created a flowing organic concert space. The swooping ceiling of the subterranean hall follows the outer form of the building, rising above ground to integrate a balcony. As in Andermatt, windows at this level bring in daylight and provide passers-by with a fascinating view into the concert hall.

Kahle Acoustics orientated the hall with the stage in the lower part to maximise acoustical projection from the ceiling, thereby also placing the audience in the tallest, most resonant volume. Moreover, the oak bands of the side walls bend and fold to create enveloping sound reflections.

“The alpine town of Arlberg has demonstrated that when it comes to high-quality architecture, art and music, the saying ‘build it and they will come’ holds true,” says Eckhard Kahle.

Above: The swooping ceiling of the chamber music hall at St Christoph am Arlberg follows the exterior form and its shape is acoustically optimised

Musikverein in Vienna, Austria, and other fine shoebox halls,” says Kahle.

Working with both a physical scale model and computer simulations of the hall, Kahle

Acoustics collaborated closely with Studio Seilern to perfect the acoustics of the origami interior. Every facet of the balcony fronts, walls and ceiling has been optimised to direct sound reflections both to the orchestra for musical communication, as well as to the audience to build acoustical presence, clarity, spaciousness and a strong natural character. Hidden reflectors in the stage and white suspended reflectors guide the sound from the musicians to the audience, enhancing musical projection.

From street level, the suspended reflectors are seen as floating over an empty space, like a sculpture in a glass box. Passers-by can see into the concert hall, achieving Studio Seilern’s aim of creating an active frontage to the pedestrian street, rather than the typical closed-off box.

Active acoustics

The final piece of the acoustical puzzle is the Amadeus Active Acoustics system. Conceived from day one as part of the acoustical solution, the system uses a multitude of microphones and loudspeakers, along with acoustical processing technology, to generate subtle additional sound reflections. “In the concert setting, these

reflections create the subjective acoustical impression of a longer hall and thereby increase the expansiveness of the sound,” says Kahle.

With the help of a test orchestra, the Amadeus system settings were carefully refined to completely mesh with the natural acoustic, to create an entirely natural and plausible result. The electroacoustic system is always on and the enhanced acoustic can be considered the true acoustic of the hall that the designers had intended from the start.

After the first rehearsal in Andermatt, the leader of the Berlin Philharmonic Orchestra commented that “we hear ourselves and each other perfectly” – a good basis indeed for top-quality music-making.

“As the final notes of the opening concert resonated in the hall, it was clear that Sawiris’ desire to create a unique venue with world-class acoustics had been successfully realised,” says Kahle. “To experience musicians of this calibre in such an intimate setting was truly an experience to remember.” ■

www.kahle.be

