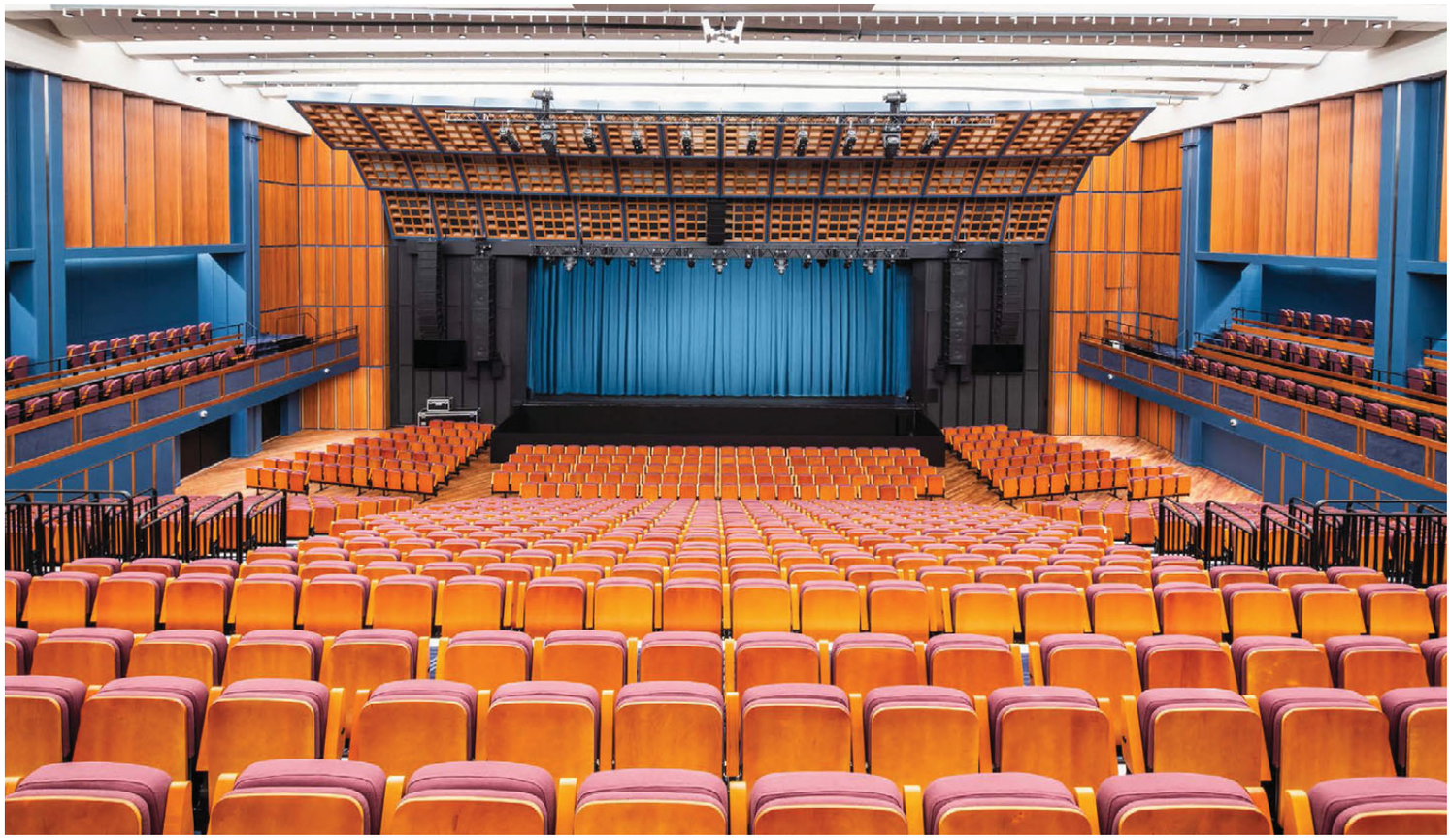

Concert hall

SOUL SUPPLIER

Anna Mitchell headed to the Scandic Falkoner to look at how one of Copenhagen's iconic venues underwent a massive technology upgrade while retaining the charm and heritage that makes it a well-loved institution.

In August 2019 the Scandic Falkoner hotel in Copenhagen's Frederiksberg district opened after a two-year renovation project. Not just any hotel, the Scandic Falkoner is attached to the Falkoner Centre, an events venue that has staged concerts and shows since 1959 and counts The Doors, The Rolling Stones, Louis Armstrong and Leonard Cohen among the many iconic acts that have performed there. In addition to the hotel spaces, the expansive renovation covered a major upgrade to the two halls within the Falkoner Centre and the creation of a modern conference centre.

In 2015 AV consultant and integrator Stouenborg was contracted by hotel owner ATP Ejendomme to handle sound, light, acoustic and AV consultancy in the main concert hall. At the same time Stouenborg got involved, ATP Ejendomme brought in the Nordic hotel chain Scandic Hotels to run the facility. In a joint effort, Scandic IT service delivery manager, Sune Nilsen, brought together AV Center, Scandic and Stouenborg to develop AV for the rest of the hotel. The total project amounted to 30 million DKK, or more than €4 million. The final integration in the conference spaces and auditorium was handled by AV Center while Stouenborg concentrated on the main hall.

Although this was a renovation project, some areas of the hotel were stripped back so far that the building requirements were similar to a new build. Hotel rooms were increased from 172 to 334 and the hallway, bar and restaurant areas were taken back to basically nothing. However, over in the performance spaces, the building teams had to be sensitive to the heritage of the building and consider some protected areas, that included two hallways with posters of acts that have played at the venue. Here, the changes were less dramatic but arguably the AV installations were more challenging.

Anders Jørgensen, project manager and senior consultant at Stouenborg, headed up the company's team working at the venue and said: "The challenge was to keep the soul of the venue while renovating and upgrading to meet the standards of today."

His team modelled spaces in 2D and 3D and created virtual reality experiences to communicate changes and upgrades to the client and project stakeholders. The 3D modelling directly contributed to a change in sightlines and acoustics.

Concert hall and auditorium

One of the biggest challenges of working within the concert hall was the fact that the Copenhagen metro ran directly under the venue. An initial plan to raise the proscenium had to be abandoned and the new designs had to fit into the same space which created a number of restrictions in what could be achieved.

Jørgensen said his priority in the nearly 2,000-seat concert hall was to address the acoustics of the space. "When the iron curtain was down the acoustics were good, but as soon as it was raised, we had problems," he explained. "Together with acoustic consultant Eddy Bøgh Brixen we had to work out how we could improve the space."

Prior to the acoustic improvement Bøgh Brixen used

Scandic Hotels A/S and Stouenborg ApS

[Clockwise from top] Green room restaurant and bar; Meyer Sound PA to left and right of the concert hall stage

the 3D model to predict the changes in collaboration with Stouenborg. In order to predict the new reverberation time Bøgh Brixen carried out several measurements of both the stage tower and the hall. This showed a reverberation time in a raw stage tower around 7 seconds and a hall with seats around 1.4 seconds.

Acoustic treatment of the whole room was the first step. Stouenborg and Bøgh Brixen designed and installed acoustic panels made using a combination of different materials with the objective of creating an absorber that targeted low and high frequencies at the same time. The inspiration for this came from the SLAM principal developed by the BBC in the early 1950s. Taking that principal to 2018, the team developed a new absorber made partly with materials from Rockwool, Fibertex and an environmental recycled material from the Swedish manufacturer Acoustic Miljø called Echo Sund. They carefully designed layering and depth of the fabric to deliver the perfect absorption from each panel with such success that the integrator has now trademarked the panels and will offer them as a standalone product. At the back of the stage the panels are installed behind a grille to protect them from damage.

With the acoustic panels in place, the reverberation time was significantly lowered. The hall still has a reverberation time of 1.4 seconds throughout the frequency spectrum, while the stage tower has been subdued to a reverberation time of approx. 1.1 second. When the iron blanket opens, the total reverberation time reaches approx. 1.3-1.4 seconds which has been noticed by the acts already preforming in the room.

A Meyer Sound Leopard PA system with 900-LFC subwoofer was specified and installed with AVB chosen as the backbone of the huge audio system. Jørgensen wanted to send audio over the network so you could "send sound wherever you want" throughout the complex. The installation is the first time that Stouenborg has used AVB to distribute sound with Jørgensen noting it is also the first installation in Northern Europe of this kind. The network installation is huge, and the main hall operates on its own network.

The drive rack for the Meyer Sound Galileo Galaxy system is placed above the stage along with the motor and pulley system for the fly bar system, which has been in place since the 1950s. This was renovated and restored and in addition ten new hoists from ASM stagetech by Priebe Hold were installed. The new hoist system can be controlled from the ASM Genesis automation system and Priebe Hold also handled all the scenery, draperies, trusses, cranes and motors.

Rear projection, powered by Panasonic DLP PT-RZ21K projectors, is used on the stage with a 12.5m wide Da-Lite Fastfold projector screen installed and delivered by AV Center together with Sony 85-in support screens on each side of the proscenium.

MA Lighting was chosen for lighting infrastructure in conjunction with Luminex switches (GigaCore10) and MA nodes. Robe's followspots are used on the stage with lighting control accessed via a grandMA lighting console in the technical room. SSL consoles (L-200) are provided for audio mixing along with Sennheiser system 6000.

As part of the complete renovation of the main hall Stouenborg was responsible for installing a vast Cat7a infrastructure. Jorgenson notes that this was to futureproof the installation, but for this project they terminated in Cat6 S/FTP.

The venue wanted artists to be able to see and hear everything that was happening on the stage as well as have access to a paging system. Stouenborg designed and installed a house call system based on Atlona OmniStream distribution that is accessed from the stage via a Crestron touch panel.

Jørgensen says they chose to base the system on OmniStream because it was "simple, cost-effective, reliable and PoE driven". He continues to explain that the company decided to create the system themselves after failing to find anything appropriate on the market after trawling ISE and Infocomm trade shows. "It was easy to find a system that could be used for the audio and paging,

> It was easy to find a system that could be used for the audio and paging, but no one took the video part into consideration.
>
> *Anders Jørgensen, Stouenborg*

Scandic Hotels A/S and Stouenborg ApS

Conference centre

Tech-Spec

Audio
Barix background music system
DPA microphones
Genelec 4010-AW monitors
Harman BSS Soundweb DSP, JBL pendant speakers and Crown amplifiers
Meyer Sound PA: Leopard, 900 LFC, Lina, UPJ-1P, MJF-208 and Galileo Galaxy
Sennheiser Digital 6000 wireless microphone system
SSL consoles, L-200 and SSL 8632.24
Stouenborg acoustic panels
Yamaha mixing console CL1 and RIO3224

Control and distribution
Luminex switches
Atlona OmniStream
Crestron touchpanels and DigitalMedia and NVX system

Lighting
MA Lighting grandMA consoles with node
Lumen Radio CRMX Nova
RobeSPOT – following spot
Robert Juliet ZEP LED 300 W profile spot
Martin ELP fixtures

Stage machinery
ASM with Genesis control system
Priebe Hold stage machinery
Gerriets drapery

Video
Analog Way Pulse switcher
Barco ClickShare
Da-Lite projector screen
Harkens projection screen
Panasonic DLP PT-RZ21K projectors, AW-HE60 cameras
Samsung 37-in SH37F displays
Sony 85-in displays

but unfortunately no one took the video part into consideration," he says. "Therefore, we decided to develop a control system that could do both."

The system is completely configurable so rooms can be renamed and could be replaced by actors' names for example to make calling the right person simple and quick. Stage managers can call a single room or groups of rooms.

As part of the system, Genelec 4010-AW monitors are used in the 28 dressing rooms. Performers and stage staff can set the level of the monitors within each room with an override function still managed centrally in case of important announcements or alarms. Small LCD panels from Panasonic (TH-48LFE8E & TH32EF1E) in these rooms allow a view on to the stage that is fed by camera input from Panasonic cameras (AW-HE60) and sound from the venue is captured by DPA microphones (4017C). Alternative video signals can be sent into the rooms as well.

Stouenborg is now marketing the system to other theatres and already has two orders that will be delivered during 2020 and 2021.

The 510-seat auditorium follows in many ways a similar technology template to the concert hall but are driven from Crestron on the AV side with an Analog Way Pulse switcher for the demanding operations. It houses a single Panasonic DLP PT-RZ21K projector and a Meyer Sound Lina rig with audio and lighting consoles provided in the room. A Yamaha CL1 was selected for audio mixing and Zero88 FLX24 as lightning console. In addition there are Martin ELP light fixtures for the stage.

Meeting rooms, digital signage and background music

During the tour around the facility the new technical manager for Scandic Hotels, Caspar Ravn, showed the new conference centre installed by AV Center. It is made up of ten rooms, over two floors that can be reconfigured according to requirement and has capacity for up to 1,000 people. Rooms can also be merged to create a ballroom.

Ravn showed how the room could be easily managed by the programmed presets that follow the Scandic standard, which has been implemented in almost all its hotels across Denmark, and can be accessed via Crestron touchpanels placed in every room. The sound is based on the BSS Soundweb London system that handles the audio processing required to adapt the spaces in conjunction with JBL Control45CT speakers. A wireless microphone system also spans all areas. Speakers can be allocated a Sennheiser Digital 6000 series microphone which they then keep hold of regardless of where they are speaking. The Sennheiser microphones were chosen as a result of Scandic Hotels standardising on certain technologies.

Ravn also showed the conference spaces' completely flexible AV infrastructure. A multiple network with ports and connection boxes is installed throughout the conference centre with a Crestron 32x32 Digital Media matrix at its heart. This allows content from any space to be routed to any other and it is easy to use smaller spaces as overspill for large events in the concert hall and auditorium.

The digital signage installed by AV Center uses Samsung 37-in SH37F displays as signs that look like light boxes but are able to be changed according to the event, together with portrait mode signage screens spread-out over the complete facility.

The hotel's background music system extends across the conference spaces, restaurants, lobbies and uses mainly JBL speakers that are powered with Crown amplifiers. The background music is fed by Barix as part of a system that is controlled from Scandic Hotel's main headquarters.

'It sounds better'

The installation has now been handed over to a technical team of four, employed by the hotel and responsible for supporting conferences and touring acts. For Ravn, the audio upgrade has made the biggest difference to the concert hall. "It sounds better, it provides better coverage and the Galaxy system provides us with control and flexibility," he said.

His team is busy. The conference centre is almost always booked and at the time of Inavate's visit Disney's Tarzan was just about to start a four-month run.

To attract a renowned show of this type is testament to the quality of the technical equipment provided in the hall and, Stouenborg, Scandic Falkoner and ATP Ejendomme have managed to create a concert hall that can hold its head high on the international stage. Most importantly, the care and attention in preserving certain details of the hall has been key to making sure the venue retains its soul.

Scandic Hotels A/S and Stouenborg ApS