Concert Halls • Theaters • Opera Houses • Convention Centers • Cinemas • Arenas

# auditoria

Annual 2018/19

Also inside:



# Foro Boca

## The new home of the Boca del Río Philharmonic Orchestra in Veracruz, Mexico

*Philharmonie de Paris - Paris, France*

# CAPTIVATING PERFORMANCE

## SOUND SOLUTION FOR PERFORMING ARTS CENTERS

L-Acoustics sound systems are renowned for their uniform, full-range, natural sound. Our flexible, light-weight systems project crystal clear sound to your audience, avoiding reverberant architecture. From the front row to the back balcony, your audience will be put into the heart of your program. From powerful dynamic music, to subtle orchestra through to perfect speech, L-Acoustics faithfully projects the artiste so that each patron is captivated by the performance. Let our sound systems help you achieve maximum engagement for your Performing Arts Center. **www.l-acoustics.com**

Jaime Navarro/ Rojkind Arquitectos

# contents




**Editorial**
Editor: **Izzy Kington**
*isabel.kington@ukimediaevents.com*
Production editor: **Alex Bradley**
Chief sub editor: **Andrew Pickering**
Deputy production editor: **Nick Shepherd**
Senior sub editor: **Christine Velarde**
Sub editors: **Tara Craig, Alasdair Morton**

**Design**
Art director: **Craig Marshall**
Art editor: **Andy Bass**
Design: **Anna Davie, Louise Green, James Sutcliffe, Nicola Turner, Julie Welby, Ben White**

**Production**
Head of production/logistics: **Ian Donovan**
Deputy production manager: **Robyn Skalsky**
Production team: **Carole Doran, Bethany Gill, Frank Millard, George Spreckley**

**Advertising and Publishing**
Publication director: **Damien de Roche**
*damien.deroche@ukimediaevents.com*
Publication manager: **Ram Seira**
*ram.seira@ukimediaevents.com*
Circulation/subscriptions manager: **Suzie Matthews**
Editorial director: **Anthony James**
Managing director: **Graham Johnson**
CEO: **Tony Robinson**

Published by UKi Media & Events, a division of UKIP Media & Events Ltd, Abinger House, Church Street, Dorking, Surrey, RH4 1DF, UK Tel: +44 1306 743744 • Fax: +44 1306 742525 • Email: auditoria@ukimediaevents.com. Printed by: William Gibbons & Sons Ltd, 26 Planetary Road, Willenhall, West Midlands, WV13 3XT, UK.

ISSN 1476-4105 (Print) 2397-6489 (Online)



The views expressed in the articles and technical papers are those of the authors and are not endorsed by the publishers.

While every care has been taken during production, the publisher does not accept any liability for errors that may have occurred.

Subscriptions £85/US$110 per annum
This publication and its contents are protected by copyright ©2018

If you wish to cancel your subscription to this magazine please email datachanges@ukimediaevents.com. For more information about our GDPR compliant privacy policy, please visit www.ukimediaevents.com/policies.php#privacy. You can also write to UKi Media & Events, Abinger House, Church Street, Dorking, RH4 1DF, UK to cancel your subscription or request a copy of our privacy policy.



Airfreight and mailing in the USA by agent Air Business Ltd, c/o Worldnet Shipping USA Inc, 155-11 146th Street, Jamaica, New York 11434. Periodicals postage paid at Jamaica, New York 11431. US Postmaster: Send address changes to Auditoria, c/o Air Business Ltd, c/o Worldnet Shipping USA Inc, 155-11 146th Street, Jamaica, New York 11434. Subscription records are maintained at UKi Media & Events Ltd, Abinger House, Church Street, Dorking, Surrey, RH4 1DF, UK. Air Business is acting as our mailing agent.


Cover image: Jaime Navarro/ Rojkind Arquitectos

# foreword

I'm not the sort of person who signs petitions all the time, but one cause prompted me to do so recently. A pub in the city I live in was the subject of a noise complaint from the developer of a set of new apartments next door – although the pub says it raised the issue of its frequent use as a venue for live music, theater and comedy during the flats' planning application. The pub in question is more than 400 years old and is where rock band The Stranglers played their first gig. At the time of going to press, nearly 20,000 people have signed in favor of the venue, and a local councilor has also expressed support.

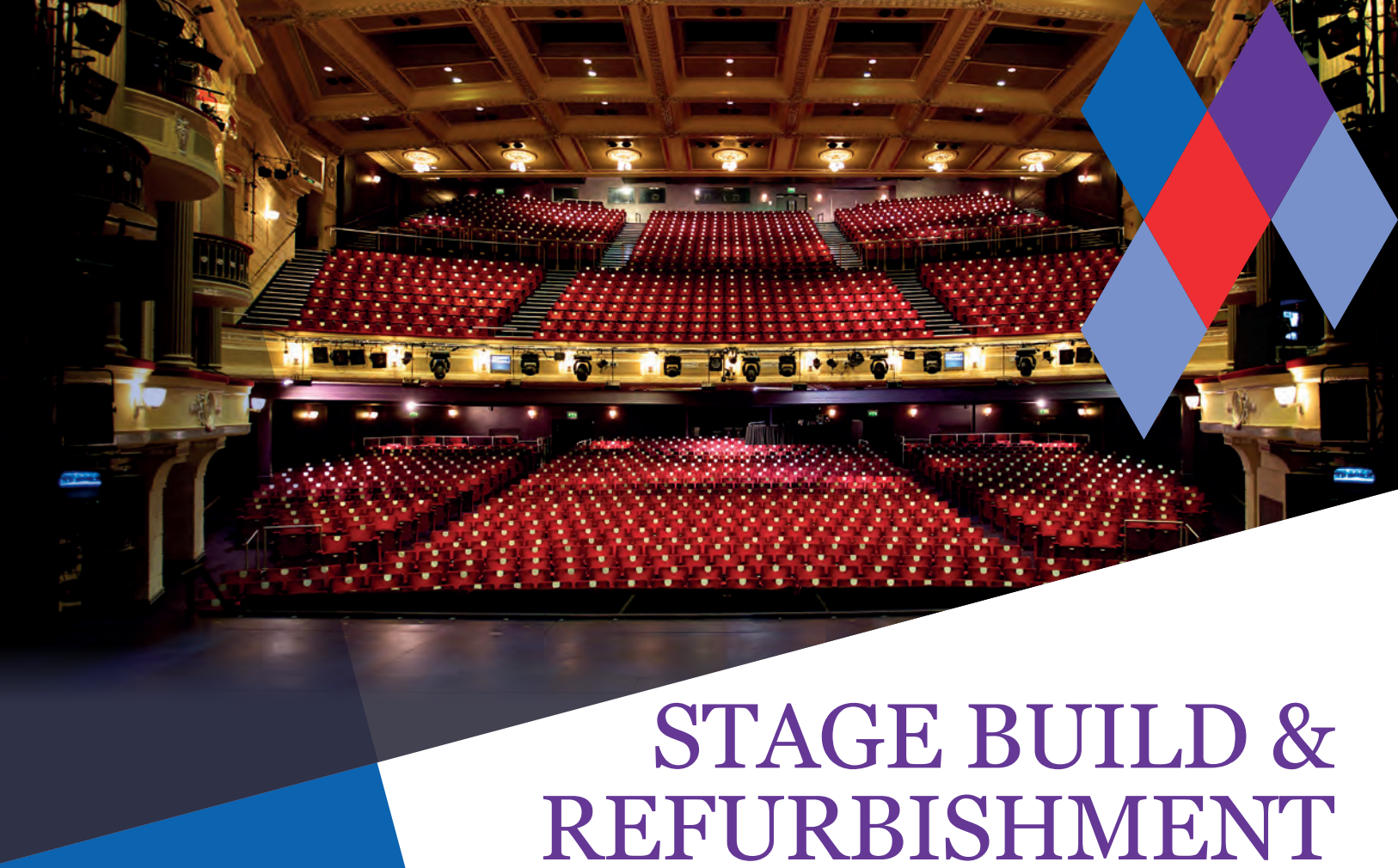
It is exactly this kind of accessible venue that can help to build a place's cultural life, from the ground up – fostering a love for the arts that can perhaps later benefit other types of institutions. Temporary and portable venues perform a similar service – bringing the arts to remote communities and creating a fun, informal atmosphere that engages new audiences. In the feature on page 18 we take a look at some great examples of temporary venues – including an incredible full-size replica of Shakespeare's Rose Theatre – and on page 140 we toast some of the best pub theaters.

We've also definitely not neglected larger, purpose-built performing arts centers and their operation! Turn to page 32 to get to know three leaders who have recently taken the helm at big-name institutions, and to page 12 to delve into three projects where historic, treasured venues had to be updated to meet the needs of the 21st century. In all cases, sensitivity is required to avoid crushing what makes these venues special in the first place.

You can also read all about two jaw-droppingly beautiful new developments in Taiwan and Mexico, on pages 6 and 26 respectively. In fact, there are so many case studies in this issue that I don't have room to mention them all here – so I suggest you dive right in and enjoy!

**Izzy Kington, Editor**


# contents



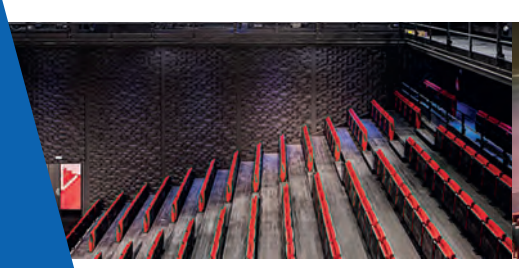
# STAGE BUILD & REFURBISHMENT EXPERTS

Harlequin is the world leader in advanced technology floors and stage systems for the performing arts.

Our expertise in regional and global theatres means that Harlequin remains the industry choice for the world's most prestigious dance and performing arts companies, theatres, venues and schools.

Harlequin stage systems deliver on strength, flexibility and meeting the technical requirements of dip traps, trap doors, ballet wagons and orchestra pit fillers. We offer a number of bespoke stage build solutions from traditionally built stages, modular stages using the new Harlequin Stage Deck system and we also refurbish and replace stages.

Harlequin is the global leader in its field with offices in Europe, The Americas and Asia Pacific.



"Harlequin is the best in the business and why everyone recommended you to me"

**Ellen Frost**
**Theatre Manager, Shaw Theatre**

"We've been using Harlequin flooring since 1997 and the reason we come back time and time again is because we know the products and the customer service is excellent"

**Tom Harrison**
**Production Manager, Glyndebourne**

"The right floor is something absolutely essential for theatre and even more so for dance as it ensures the quality of the performance"

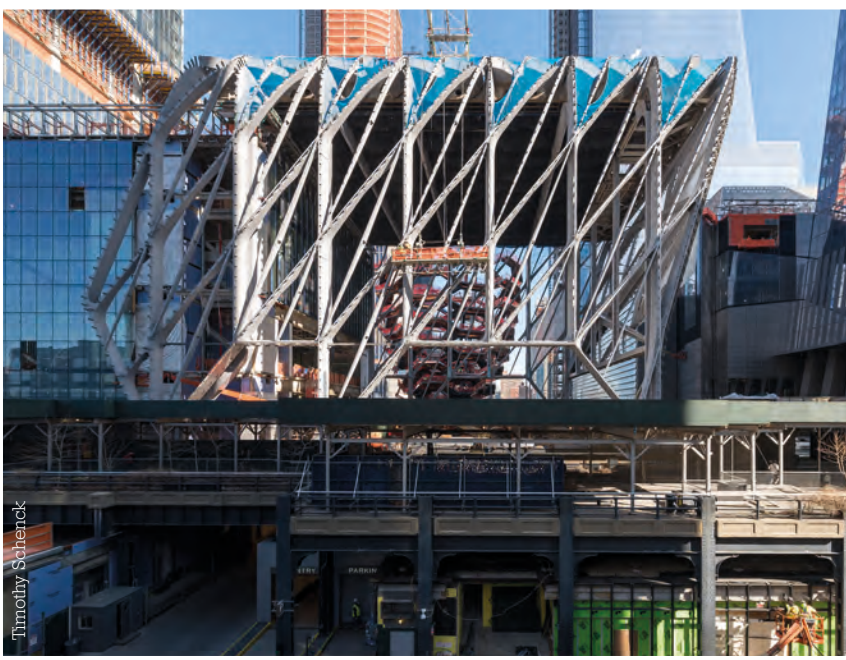
**Didier Deschamps, Director, Chaillot National Dance Theatre, France**

**+44(0) 1892 514 888**
**enquiries@harlequinfloors.com**

HARLEQUIN
www.harlequinfloors.com

Above and below: **When deployed, the shell doubles The Shed's footprint, creating a flexible performing space**
Right: **The shell structure is already functioning**

Diller Scofidio + Renfro/Rockwell Group



Timothy Schenck

# Auditoria loves...

## ...The Shed, a new arts center being built in New York City, complete with a telescoping outer shell

Diller Scofidio + Renfro/Rockwell Group

Taking shape on Manhattan's west side is an iconic structure – an extremely flexible new home for the performing arts, visual arts and popular culture, designed by Diller Scofidio + Renfro and Rockwell Group.

The Shed is an eight-level building offering 25,000ft² (2,300m²) of column-free gallery space, a 500-seat theater that can be subdivided, event and rehearsal space and a creative lab. But the headline-grabbing feature is that the adjoining plaza can be used both for open-air or covered performances, thanks to a 200,000ft² (18,500m²) outer shell that can be rolled out in around five minutes from its nest over the base building.

The resulting 17,000ft² (1,600m²) covered space, The McCourt, offers light, sound and temperature control, with capacity for 1,250 seated or 3,000 standing (also using space from the base building's two adjoining galleries).

It is a triumph for multifunctionality and provides a very striking identity for the venue.

The shell weighs more than 4,000 tons when fully kitted out with building systems and production equipment. Inspired by the area's shipping heritage, the shell runs on a double-wheel track based on gantry crane technology. It is moved by a rack-and-pinion drive with four single-axle and two double-axle bogie wheels that are 6ft (2m) in diameter.

The steel diagrid frame will be clad in translucent panels made from ethylene tetrafluoroethylene (ETFE), designed to offer the insulation of glass at a much lower weight, and to withstand hurricane-force winds.

The kinetic elements have already been proved – they were first moved in 2017. The Shed is scheduled to open in spring 2019, offering an eclectic mix of programming led by artistic director and CEO Alex Poots. ■

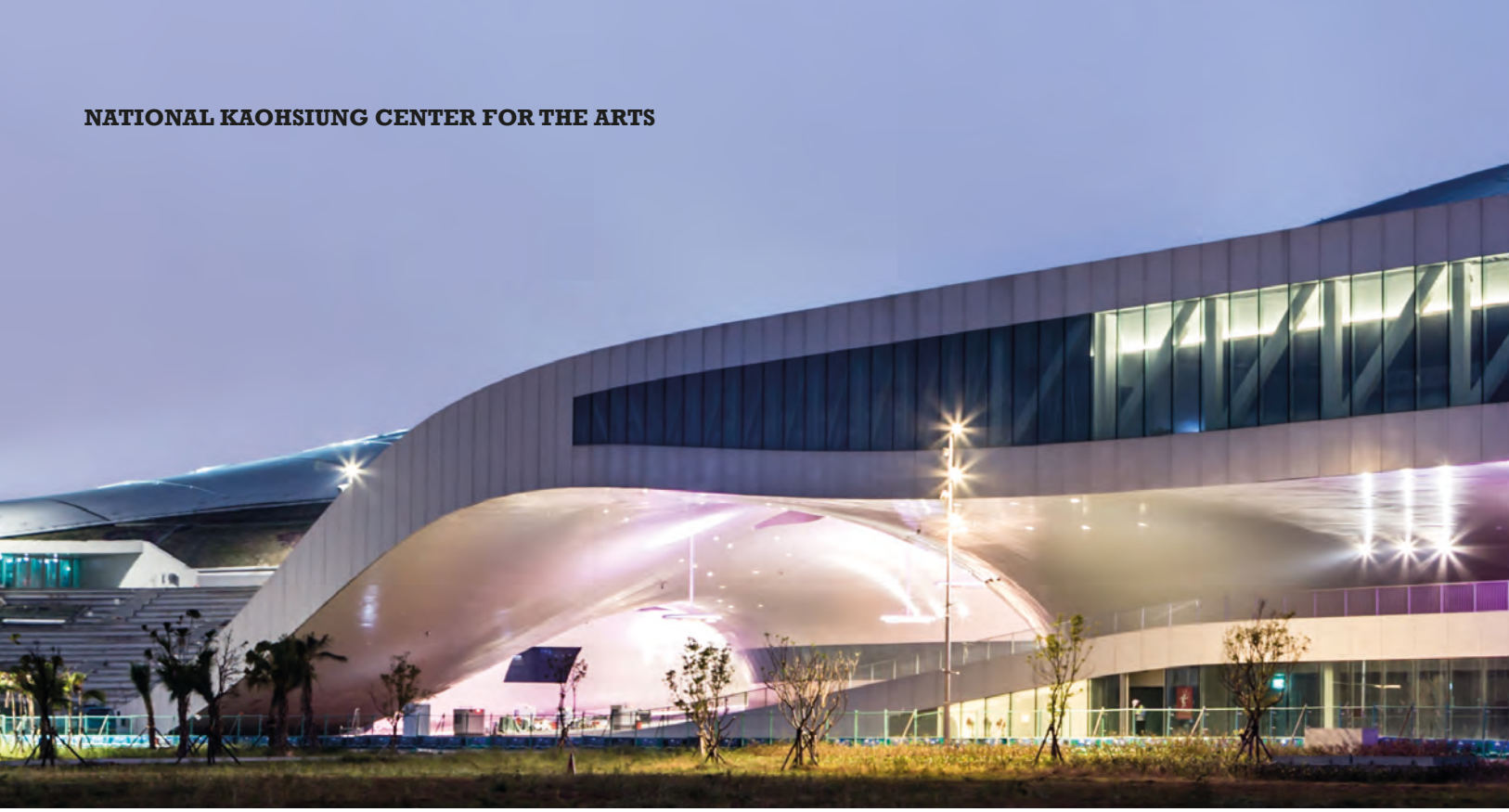
Ed Lederman

**NATIONAL KAOHSIUNG CENTER FOR THE ARTS**

RICHARD WILLIAMS

With a huge new performing arts center opening in October 2018, Taiwan is making its presence felt on the cultural map

# rand statement



It is billed as the world's largest performing arts center under one roof, and the National Kaohsiung Center for the Arts in Kaohsiung, Taiwan, is certainly impressive. The facility covers 141,000m² (1,517,700ft²) and incorporates five separate performance spaces. It was built at a cost of nearly T$10.7bn (US$366m) on the site of a former military base in the newly regenerated Weiwuying Metropolitan Park.

While it is Taiwan's second city, Kaohsiung is an industrial area with a thriving harbor and ship-building industry, making it perhaps an unlikely location for one of the world's largest cultural centers.

"Our government was really looking to change the cultural landscape in Taiwan," explains Gwen Chang, head of international partnerships at the National Kaohsiung Center for the Arts. "While Kaohsiung has a population of 2.7 million people, it was thought of as a cultural desert. We have a national theater in Taipei and performing arts, but nothing in Kaohsiung."

The 9,085-pipe organ in the concert hall is thought to be the largest in Asia

### Audience engagement

The facility is scheduled to open in October 2018, the whole project having taken nearly

## TREE OF INSPIRATION

One of the biggest inspirations for the design was the banyan tree, found everywhere in the region. "When we first arrived, the site was a military compound, but the things I noticed straightaway were the banyan trees," recalls architect Francine Houben of Mecanoo. "The banyan is a very large and striking tropical tree. Each mature specimen can become like three or more connecting trees, as the spreading roots thicken and reach up, either to join the primary trunk or form new trunks. Meanwhile the crown of the banyan is thick and very horizontal, a dense canopy that offers protection from rain and sun."

Houben says that everyday events and gatherings traditionally take place beneath the banyan trees, and she wanted the building to reflect this, leading to the idea for Banyan Plaza.

"As I spent time in Kaohsiung, and studied the shape of these magnificent trees, they revealed a formal language that gave us the overall theme for our design," she says. "The plaza works like a banyan tree, gathering and sheltering people while allowing easy movement in and out. With its walkways and informal spaces, it enables people to do all the things they do beneath a banyan tree – even create impromptu performances. The atmosphere there feels exactly right."

Main: **The fluid design is intended to blend the venue into its tropical surroundings**
Below left: **The 2,000-capacity, vineyard-style concert hall**
Below inset: **The opera house, which seats 2,260 people**

12 years from inception to completion. It is a bold move, as there is no guarantee there will be a market big enough to justify the expense. "We know it will take time to cultivate an audience," says Chang. "We have undertaken lots of activities to motivate both older and younger generations over the last seven years."

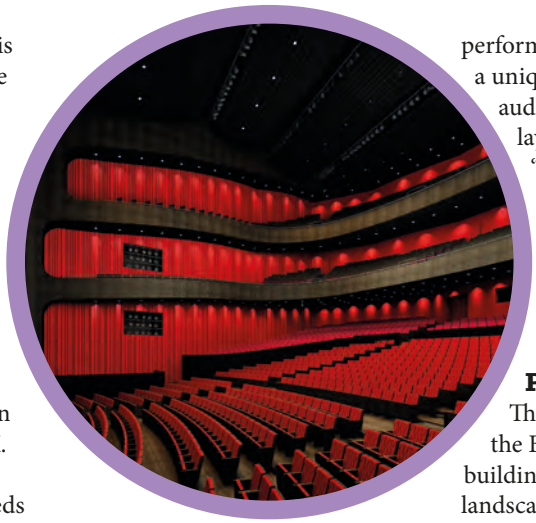
The task of designing the venue fell to Netherlands-based Mecanoo, which has completed previous projects including Delft University of Technology Library in the Netherlands, La Llotja Theatre in Spain and the Library of Birmingham in the UK. The company began this project in 2006.

"The idea was to create a venue that feeds into the tropical park," says Francine Houben, founding partner and creative director at Mecanoo. "We wanted the building to look natural and organic, so it blends into its tropical surroundings. This is why we have these slopes that look like hills. Everything is very organic and intimate; it is inspired by nature."

### Open arms

This focus of intimacy is also reflected in the auditoria, which Houben describes as being universally welcoming, not imposing, spaces: "In the concert hall, for instance, people can stand around the pianists, and the acoustics are extremely good."

As well as the concert hall, there is an opera house, playhouse, recital hall and an outdoor performance space. Houben wanted to provide a unique experience in each of the four auditoria. "They each have their own identity, layout, acoustic and ambience," she says. "For example, the layout of the concert hall is very organic, with a vineyard style. The recital hall is intimate in character; the opera house grand. The outdoor space will lend itself to informal performing arts, maybe yoga or tai chi."



### Public property

The auditoria are linked by an open area, the Banyan Plaza, which runs throughout the building. "While visitors traverse the continuous landscape of the Banyan Plaza, they will not

## FIVE PERFORMANCE SPACES

The Kaohsiung Center for the Arts incorporates five separate performance spaces.

- The 2,260-seat opera house has a proscenium design and orchestra pit, and is equipped with the latest stage technology to enable large-scale performances.
- The vineyard-style concert hall seats 2,000 people and has an impressive organ, built by Orgelbau Klais.
- Theater, dance and Chinese opera will find a home in the playhouse, which can be configured with proscenium and thrust stages, seating between 1,094 and 1,254.
- Both chamber music and solo recitals will feature in the 470-seat recital hall.
- In addition to all this, there is an outdoor performance space that starts on the roof as a terrace and links the building with the park. It can accommodate audiences of up to 20,000 people.

NATIONAL KAOHSIUNG CENTER FOR THE ARTS

realize they are in fact ascending and/or descending an entire level," says Houben. "We wanted to blur the boundaries between the outside and the inside, and create a superb public space running right through the ground floor. What's unique is that the four auditoria are next to each other, but have a tropical space in between them."

Banyan Plaza takes the form of a cargo ship, and was built by local ship builders. "There is a strong ship-building community in the area, so it was important for us to represent this part of Taiwan," says Houben.

The overall building can look flat, but that is an optical illusion; at its highest point, the opera house rises 47m (154ft) above the ground. The outstretched design did create problems. "The building is very horizontal, so to get the logistics right was difficult," recalls Houben. "We had to make the logistics of the main auditoria very logical. Each venue is a world-class performance space. To achieve this required the best in products and expertise from around the world."

### Logistical challenges

Theater consultant Louis Janssen, from Netherlands-based Theateradvies, remembers the challenges involved. "The most important thing was planning the logistics," he comments. "Getting the audience in, the staff, theater equipment, all the ingredients for performances, was a challenge."

Because all the stages are on the same level, the theater doesn't need cargo elevators. Instead, there are five full loading bays for 18m (59ft) trucks inside the building, allowing the loading and unloading of sets, instruments and other heavy equipment.

## CLIMATE CONTROL

The roof is made from aluminum, minimally detailed, with shaped skylights cut into it at intervals to allow in natural daylight. The walls have similar openings but are constructed from steel. The design allows sea breezes to provide natural cooling.

"The auditoria have air-conditioning, which is essential for all modern performing arts spaces," says Francine Houben of Mecanoo. "However, as you come out into the foyers, the temperature rises a little and then, when you emerge fully into the Banyan Plaza, you are greeted by the soft, warm air from the sea that wafts through the space."

The arts center is part of a regeneration package that has seen a 47ha (116-acre) military base converted into parkland

"Another of the biggest challenges was the sheer scale of the theater," explains Janssen. "There are four venues inside and another on the roof that touches the ground on one side, which was a big challenge. There's a full-size opera stage, a full side stage, and an under-stage area where a complete set can be stored beneath the main stage."

But there was one area in particular that Janssen really struggled with. "I'm a big aficionado of using daylight on the stage," he says. "Here it was just too difficult, but the theater is world class, state-of-the-art. It has world-class acoustics, stage equipment and layout."

### Varied program

Under executive and artistic director, Chien Wen-Pin, the Berlin Philharmonic Orchestra under Gustavo Dudamel will be among the first artists to perform at the center.

International collaborative partners include the Lincoln Center for the Performing Arts in New York, USA; the Spoleto Festival USA; Singapore International Festival of Arts; the Deutsche Oper am Rhein German opera company; Esplanade – Theatres on the Bay in Singapore; and Aerowaves Spring Forward, a contemporary dance festival.

"Weiwuying is one of the most beautiful, iconic and best-equipped performing arts centers in the world," says Wen-Pin. "The creative industries are extraordinarily lively in Taiwan. Once our doors are officially open, the center will become an exciting springboard from which talent can soar."

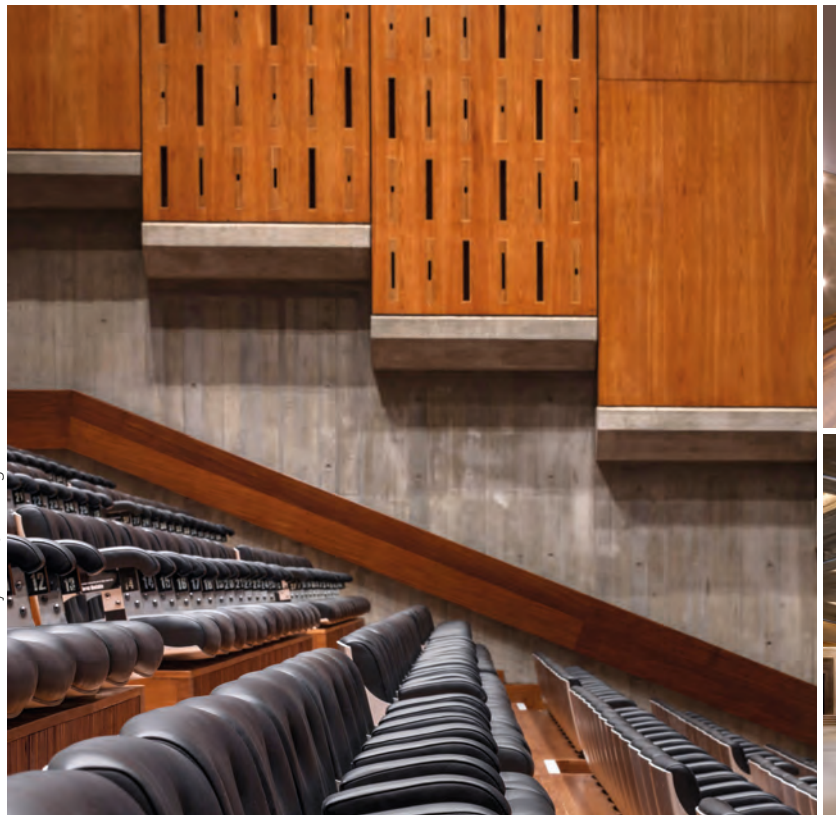
"It is a very welcoming building," adds Houben. "It is a building for everybody, not just for a certain group, and I think the program will reflect this." ■


MEGA
Pointe
THE NEW REFERENCE POINT
ROBE®
www.robe.cz

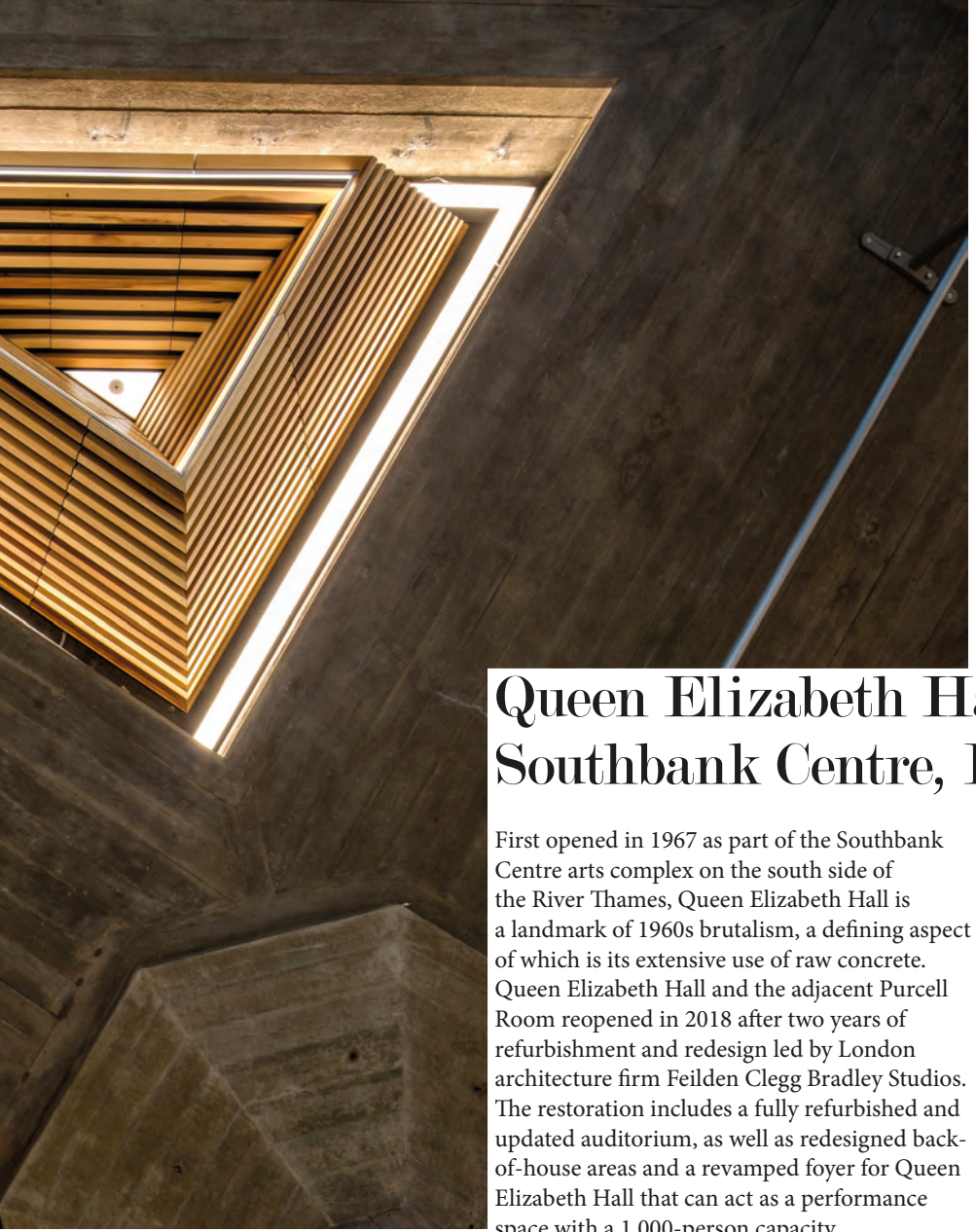
# Revising history

Three recent concert hall renovations demonstrate how contemporary technologies and craftsmanship are bringing new life to cherished buildings

The Queen Elizabeth Hall's signature board-marked concrete has been restored to its original look with the help of Arte Mundit, a latex poultice more commonly used on classical sculptures and in stone conservation



Morley Von Sternberg



# Queen Elizabeth Hall, Southbank Centre, London, UK

First opened in 1967 as part of the Southbank Centre arts complex on the south side of the River Thames, Queen Elizabeth Hall is a landmark of 1960s brutalism, a defining aspect of which is its extensive use of raw concrete. Queen Elizabeth Hall and the adjacent Purcell Room reopened in 2018 after two years of refurbishment and redesign led by London architecture firm Feilden Clegg Bradley Studios. The restoration includes a fully refurbished and updated auditorium, as well as redesigned back-of-house areas and a revamped foyer for Queen Elizabeth Hall that can act as a performance space with a 1,000-person capacity.

According to Southbank Centre property director Mark Rushworth, although modest modifications had been made to the building over the years, there had been no significant maintenance since its original opening. "Facilities had become worn out and outdated and no longer up to the world-class standard that audiences and artists expected and deserved," he explains.

## Unique features to preserve

But while the buildings are not formally listed, "They are regarded as being of historical and architectural importance, and Southbank Centre treats them as such," notes Rushworth. "We took great care to ensure that the refurbishment protected the unique features of the buildings, while improving technical facilities to bring them up to world-class standards. The proposals were based on the principal of taking the buildings back to their original splendor, rather than changing the design or character."

Inside the Queen Elizabeth Hall, the iconic timber and concrete performance spaces have been revitalized. The venue's signature board-marked concrete has been restored to its original look using Arte Mundit, a latex poultice more commonly used on classical sculptures and stone conservation projects.

In addition, production infrastructure has been redesigned to reduce visual impact. For example, there is a new container for Queen Elizabeth Hall's two fixed lighting bridges (which were added in the 1980s). These can now be retracted to disappear into the ceiling when not required.

## Confined spaces

"There were significant issues in the removal of the existing plant and equipment along with metal ductwork and electrical cable, due to numerous confined and inaccessible locations," says Rushworth. "In some cases, operatives had to work in extremely confined spaces to cut such equipment into sufficiently small pieces that they could be removed through small holes in the structure."

Restoring Queen Elizabeth Hall involved a lot of technical challenges, and Rushworth believes the key was to understand these before the work began. "Extensive surveys are necessary to fully understand the scope of work both from a cost and buildability perspective," he says. "This is necessary because it fundamentally affects the contract program and the cost of the work. Costs have to reflect the methodology that is necessary in each case, which often includes additional works to provide access or handle materials."


# Massey Hall, Toronto, Canada

When first constructed in 1894, Massey Hall was not a true concert hall or theater so much as just one big room, lacking a true lobby and, because of its constrained site, without proper space for dressing rooms and rehearsal spaces. Over the years, as the building became a beloved landmark for the city, a series of renovations changed its original form, adding an Art Deco component to its original Moorish revival decoration and creating a small bar in the basement. "There wasn't a lot of respect for history," explains Marianne McKenna, a partner at Toronto's KPMB Architects, designer of Massey Hall's renovation. "They swept in with what was stylish at the time."

But after a six-year redesign and renovation process that includes expansion into a new tower behind the building, Massey Hall will be ready for another century hosting many of the hottest names in music. The process will begin by burrowing underground to build the Massey Tower, directly south of Massey Hall, and demolishing the adjacent Albert Building, to give Massey Hall an added 13,000ft$^2$ (1,200m$^2$).

## Build a bridge

"Finally we will have a loading dock, and the full floor plate underground for dressing rooms and green rooms," says McKenna. New lobbies will be added on levels two and three, but in a novel way: hanging new architecture on the old brick exterior. "These lobbies are accessed from departing the envelope at the hall at the north end and having these glass bridges that take you back to the south, and making it an enjoyable journey to get there, with bars and washrooms," the architect adds.

In addition to reimagining the Centuries bar in the lobby, there will also be a new performance space on the fourth level of the venue, part of the Massey Tower, with room for 500 people.

## It takes two

"It's going from a roadhouse to a true institution that supports a variety of music and events and outreach programs," says McKenna. "Toronto calls itself 'Music City', like Austin, Texas. Particularly with this much-desired secondary performance space for emerging talent, I think a lot of the programming that evolves will make for a completely different hat for Massey to put on. One thing we've seen is that a secondary performance venue is really important. It's hard to run a really viable space with just one venue. The lobbies can now act as spaces too. It's really important to have those different revenue streams and engage the space. When people walk in, they'll be amazed at how the old Massey Hall looks better than ever, but understand the program is completely different. The appeal of this space will change with that transformation."

Top left, above and this image: **Massey Hall before its renovation – featuring a mix of architectural styles**

Top: **A new performance space – with capacity for 250 seated or 500 standing – will open after the expansion**
Above: **The venue will be expanded with the new Massey Tower**
Below: **How the primary space – Roy Thomson Hall – will look after its renovation**

Jag G'undu/Massey Hall

# Queen Elisabeth Hall, Elisabeth Centre, Antwerp, Belgium

Constructed in 1897, Queen Elisabeth Hall in Antwerp has long been one of Belgium's most prestigious concert halls. It is part of the larger Elisabeth Centre, a 19th century Art Nouveau cultural complex that also includes Antwerp Zoo. However, since an extensive renovation in the 1950s, the venue had suffered from poor acoustics and had lost much of its distinctive interior architecture. When the owner, the Flemish government, decided to embark on a renovation that would rank Queen Elisabeth Hall among the great concert halls of Europe, the decision was made to largely start fresh.

"It needed some very serious renovations, and in the end it was decided to have the concert hall rebuilt, because that solution made more sense economically," explains Joost Maegerman, general manager of the Antwerp Symphony Orchestra.

Only the historic shell of the original Queen Elisabeth Hall was retained. The interior was changed from the original fan shape to a shoebox configuration, freeing up room for a new atrium and lobby. The original façade's materials are thus exposed as an interior wall in this new space. "The 1950s intervention was quite brutal; it had demolished and covered up quite a lot of the original," explains Stuart Mills, partner at SimpsonHaugh, which designed the new hall. "When we demolished that, all this fine original work came back to the surface, and everyone was keen to preserve it. The shoebox plan brought about a happy coincidence that the optimum shape for acoustics gave us this fantastic architectural solution that brought the building back to life."

## Acoustic boost

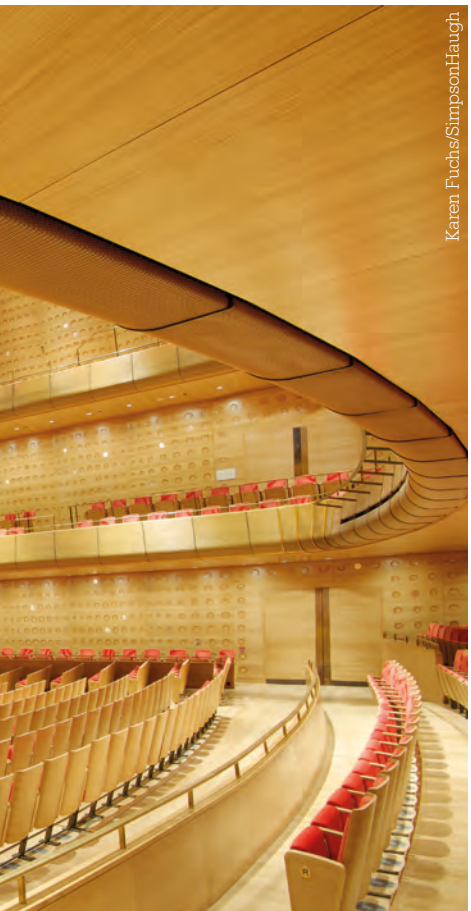
The decision to build a shoebox-shaped concert venue was also about acoustics. The venue will serve as the permanent home of the Antwerp Symphony Orchestra (formerly deFilharmonie), which has been itinerant for most of its history, and sought to compete with the world's great classical music venues. "We used oak in the auditorium and walnut around the stage, so that we could then get the lighting right to create this really intense visual experience around the stage," says Mills.

Complementing the wood is a metal mesh lining the ceiling and balconies. "We just loved the bronze color with the timber," says Mills. "But being a mesh, it's transparent. The sound from the stage goes through them. That creates an intimate space. It isn't too big or overwhelming. Because it's transparent, the sound energy can pass through and occupy the entire space."

## Lava sand

Due to structural concerns, the cavities between the acoustic panels and the concrete walls needed an extra-light material to prevent vibration, so a unique solution was found: lava sand. "The auditorium is raised above the ground; that put a limit on how heavy the auditorium could be," explains Mills. "At the same time, the acousticians needed massive walls. The solution was to use this lava material, which was heavy enough for the acoustics but not too heavy for the structure. We lined the auditorium with the timber and then cracked behind it with this volcanic rock. So far as the acoustician was concerned it was the perfect mass. So far as the structural engineer was concerned it couldn't be any heavier. It provided just the right balance." ■

Jesse Willems/ SimpsonHaugh



Karen Fuchs/SimpsonHaugh

Above: **It made better financial sense to rebuild Antwerp's Queen Elisabeth Hall. Only the historic shell was retained**
Left: **The shoebox-shaped concert hall will serve as the permanent home of the Antwerp Symphony Orchestra**

Hans Morren/SimpsonHaugh

Karen Fuchs/SimpsonHaugh

**TEMPORARY STRUCTURES**
DAVID SMITH

# Pop culture up

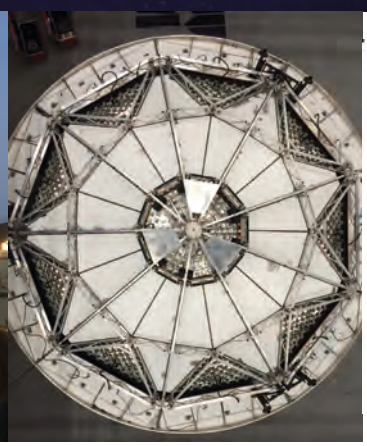
Temporary and portable venues can help make theater more accessible, flexible and varied

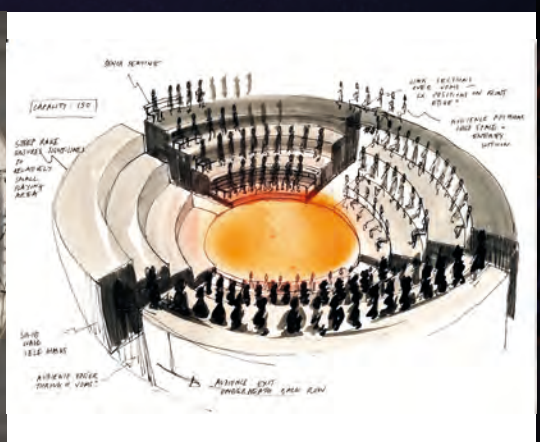
**The Rose Theatre in York, UK, is a temporary theater intended as the centerpiece for a Shakespeare festival**



"It makes everything more DIY, opening up theater to more people"

**James Grieve, Paines Plough**





## LANDING ANYWHERE

Using a 22m (72ft) diameter circular venue, UK theater company HighTide says it can stage theater anywhere from densely populated cities to remote seaside towns. Previous sites include on the beach in Aldeburgh, Suffolk, and between the high street and underground station in Walthamstow, London. The structure, known as The Mix, has flexible, multicolored seating designed by Felix de Pass and holds 267 people. The group has described its otherworldly look as "like a spaceship".

There is a trend to stage shows in pop-up theaters, which often attract younger audiences to watch innovative performances in unconventional venues. The pop-up concept encompasses a wide range of spaces, although there's a common desire to create a sense of excitement about theater and involve local communities.

Pop-up theaters in 2018 include a 950-seat replica of Shakespeare's Rose Theatre, which will stage four of the Bard's plays in York, UK. On a more bijou scale, the touring company Paines Plough's 168-seat Roundabout Theatre will travel as flat-packed furniture and be erected in a day in eight remote venues in the UK.

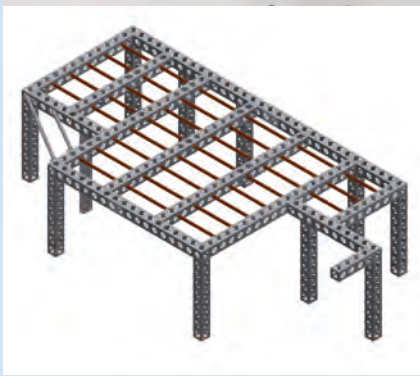
### Food and music festivals

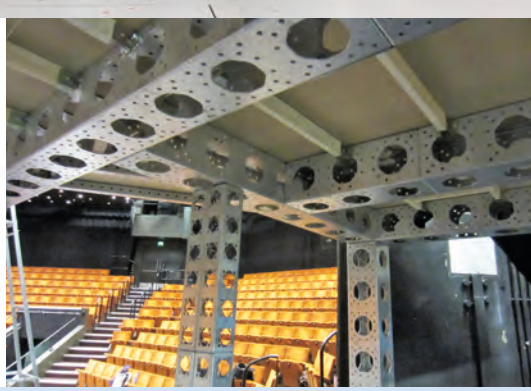
James Grieve, joint artistic director of Paines Plough, connects the enthusiasm for pop-up venues to wider trends. "Food has led the way," he says. "You can't move in London for pop-up markets or street food vendors. It makes everything more DIY, opening up theater to more people. The pop-up spirit is also connected to music festival culture. You see theater tents, poetry tents and temporary stages built in forests. There's a realization that a play performed in sacks in a clearing can be as good as one costing £50 (US$66) a ticket at the National Theatre."

Paines Plough's idea was to visit areas currently unserved by touring companies. To create the portable venue, in 2014 it commissioned theater designer Lucy Osborne and lighting expert Howard Eaton to collaborate on the project. The price tag of £500,000 (US$666,000) was considerable for a charitable organization, but Sir Andrew Lloyd Webber stepped in to provide a lot of the funding. Grieve expects the Roundabout to be in use for 10 years and reckons that £50,000 (US$66,000) per year is "great value" for a theatrical venue.

### Easy assembly

Grieve says the Roundabout can be put together by two people. The roof is hand-winched onto three goalposts, and the auditorium is pieced together underneath. Inside, panels contain 627





Opposite page and above: **Paines Plough's 168-seat Roundabout Theatre will travel, flat-packed, to eight remote UK venues**
Right: **Triple E's ModTruss construction system is perhaps best thought of as full-size Erector. Designed to create portable venues, it can also help create sets within fixed spaces**

specially designed dimmable LED lights. "The lighting helps create a highly charged, intimate space," says Grieve. "We strip productions right back, using no more than four actors. There's a reliance on actor, text, lighting and sound because the space is just 4.6m (15ft) in diameter. We've performed plays in jeans and T-shirts. The advantage is that the audience is right on top of the actors. This year, we put on Duncan Macmillan's play *Lungs*, about a couple trying to decide whether to have a baby, and it felt like the audience was involved in the conversation."

The common element to Paines Plough's projects is its ambition to involve local communities. "We are there for a week, so we ask people what they want from the space," says Grieve. "We normally put on about 20

## MODULAR SET CONSTRUCTION

The same infrastructure that can create portable venues can also be used to create sets within fixed spaces. Triple E's ModTruss construction system has been used for everything from installations at the Royal Opera House and Ballet Rambert, to a portable venue for Pleasance Beside – see page 98 for more details. The system will be used to combine a rooftop bar with a fairground helter-skelter on George Street in Edinburgh, UK. This installation is being created in partnership with Assembly Festival and will be in place for the whole of August 2018.

The system is best thought of as full-size Erector (Meccano). One notable project saw ModTruss used to build a theater set for a 2016 production at the Crucible Theatre in Sheffield, UK – its first use as a structural piece of scenery in the country.

The structure was a 37 x 19ft (11.3 x 5.7m) platform on 8ft (2.4m) uprights and used the three available sizes of ModTruss – 3in (7.5cm), 6in (15cm) and 12in (30cm). The front span of the set had to be 18ft (5.5m) and could only be supported between two points. According to Triple E, a 12in ModTruss beam was the only product available that could do the span without having a frontage deeper than 12in, as per the design brief.

The company reports that the lighting department appreciated the way the repeating hole pattern enabled it to quickly and easily install suspended scaffolding tubes on half couplers or suspend lighting fixtures directly from the beams at any point on the structure. The ModTruss also enabled certain fixtures to be hidden within the structure, leaving clean lines on the false ceiling underside.

Cable management is always a big task on a set. With ModTruss, the cables can be run inside the beams, leaving no trip hazards. Installers need only cut a hole in the show floor to have a socket in exactly the right place.

events, from history groups to pensioners' tea dances and children's dancing."

### Pop-up Shakespeare

The Rose Theatre in York is on a much larger scale – it has 600 covered seats and 350 uncovered ones – but there are parallels with the spirit of the Roundabout. The stage has been designed so that no spectator is more than 15m (49ft) from the actors, creating a "sense of immediacy", according to James Cundall, whose ancestor Henry Condell edited and published Shakespeare's *First Folio*, and who is chief executive of Lunchbox Theatrical Productions, which is putting on the festival. "It's an open-air experience as in Shakespeare's day," he says. "The actors can use audience entrances and perform in the standing area. The audience can become props, increasing their involvement. We want to get back to how Elizabethans performed theater. It's about taking audiences into a different realm."

An Elizabethan village will surround the stage, hosting free entertainments all day long, including storytelling. There will be a recreation of an Elizabethan garden and themed food. One ambition is inclusivity, and Cundall has invited 3,000 children from disadvantaged backgrounds to attend free performances.

### Historic replica

The theater is a full-size replica of the Rose Theatre, which was built in 1587 on London's South Bank and rediscovered in 1989. Recreating it using layered scaffolding was a challenge. Cundall approached specialist contractor Acorn Event Structures with sketches of the original theater.

Acorn's engineers had designed pop-up theaters before, but not on this scale. They calculated that it required 1,500m² (16,000ft²) of cladding and 30,000m (100,000ft) of tubes. In all, 60 tons of equipment would have to be taken to the site and 50 workers hired for three weeks to erect it. "It's complex because the structure has 13 sides," says Cundall. "Although the engineers could use CAD software, they couldn't be certain their calculations were right. To make sure everything was okay, we paid for Acorn to build it in their yard as a trial to ensure that everything worked as it should."

> "We want to get back to how Elizabethans performed theater. It's about taking audiences into a different realm" **James Cundall, Rose Theatre**

Above: **The Rose Theatre is a replica of the 1587 original**
Right: **Although designed as a stop-gap solution, The Shed graced London's Southbank for three years**
Below: **The Chicago Shakespeare Theater has recreated the spirit of the pop-up in a permanent venue**


## GAINING NEW AUDIENCES

**The National Theatre in London, UK, helped fuel the country's enthusiasm for pop-up theater when it attached a temporary red box called The Shed to the outside of its main building in 2013. The Shed was intended as a stop-gap solution, but it ended up staging works for three years.**

**Theater at the National tends to appeal to a limited demographic, largely white, middle class and older audiences. But 34% of The Shed's audiences were under 35 and there was greater diversity among them than the main venue usually sees.**

Chicago Shakespeare Theater/Adrian Smith + Gordon Gill Architecture

Staging the festival is a financial gamble, Cundall admits. To recoup the cost of more than £2.5m (US$3.3m), the company must sell a lot of tickets for *Richard III*, *Romeo and Juliet*, *Macbeth* and *A Midsummer Night's Dream*. However, Cundall believes the novelty will appeal and observes that York welcomes 7.5 million tourists a year. "If it works, I'll take the idea overseas and maybe come back to York next year," he says.

### An underused space

In the USA, the Chicago Shakespeare Theater (CST) has recreated the improvisational spirit of the pop-up concept in a permanent venue on Navy Pier, on Lake Michigan. The Yard has nine movable towers that can be endlessly reconfigured. Each has three stories of seating, weighs 17.5 tons and is 11m (36ft) high. Despite their size and weight, they are easy to move on a low-tech system of castors.

Chris Plevin, CST's director of production, says the outer layer of towers define the room's volume. At its largest, The Yard has 850 seats, but the towers can be moved inward away from the core walls to create a space with as few as 150 seats. "The flexibility of the tower arrangement is unprecedented," he says. "We can put them in a circle and do theater-in-the-round or put half on each side and create a traverse configuration. Or we can arrange them in a horseshoe or a traditional proscenium."

CST opened its first theater on Navy Pier in 1999 but soon outgrew the space. One idea was to house a new theater under a large white tent that covered an outdoor music venue next to the original CST theater. Moving to one of the pier's least used spaces would save millions of dollars compared with constructing a new theater.

### Low maintenance

Four years ago CST decided to make the move and turned to theatrical consultancy Charcoalblue to design the core and shell inside the tent. Show Canada, a theatrical scenery

James Steinkamp Photography

Helen Maybanks

## APPROPRIATE FOR THE WORK

In 2017, Underbelly Productions built a temporary theater at London's Marble Arch to stage *Five Guys Named Moe* (pictured), a play set in a New Orleans jazz bar. It was felt that traditional West End venues would have provided an inappropriate setting.

Underbelly designed a 607-seat wooden and canvas spiegeltent, creating an in-the-round performance space that was 26m (85ft) in diameter. The theater's dimensions enabled most of the audience to sit among the action, at cabaret tables.

Above: **With nine moveable towers, The Yard at CST can be endlessly reconfigured**

contractor, built the towers, each with its own electrical, sound, lighting and video systems. The price tag for the redesign was US$35m, but Plevin says CST saves money in the long run. "Maintenance expenses are extraordinarily low as the failure rate is minimal and all parts are off-the-shelf, so there's no costly customized equipment to maintain," he says. "If we want to add new towers to create new configurations in 10 years' time, we can build additional platforms to connect them to the core shell at low cost."

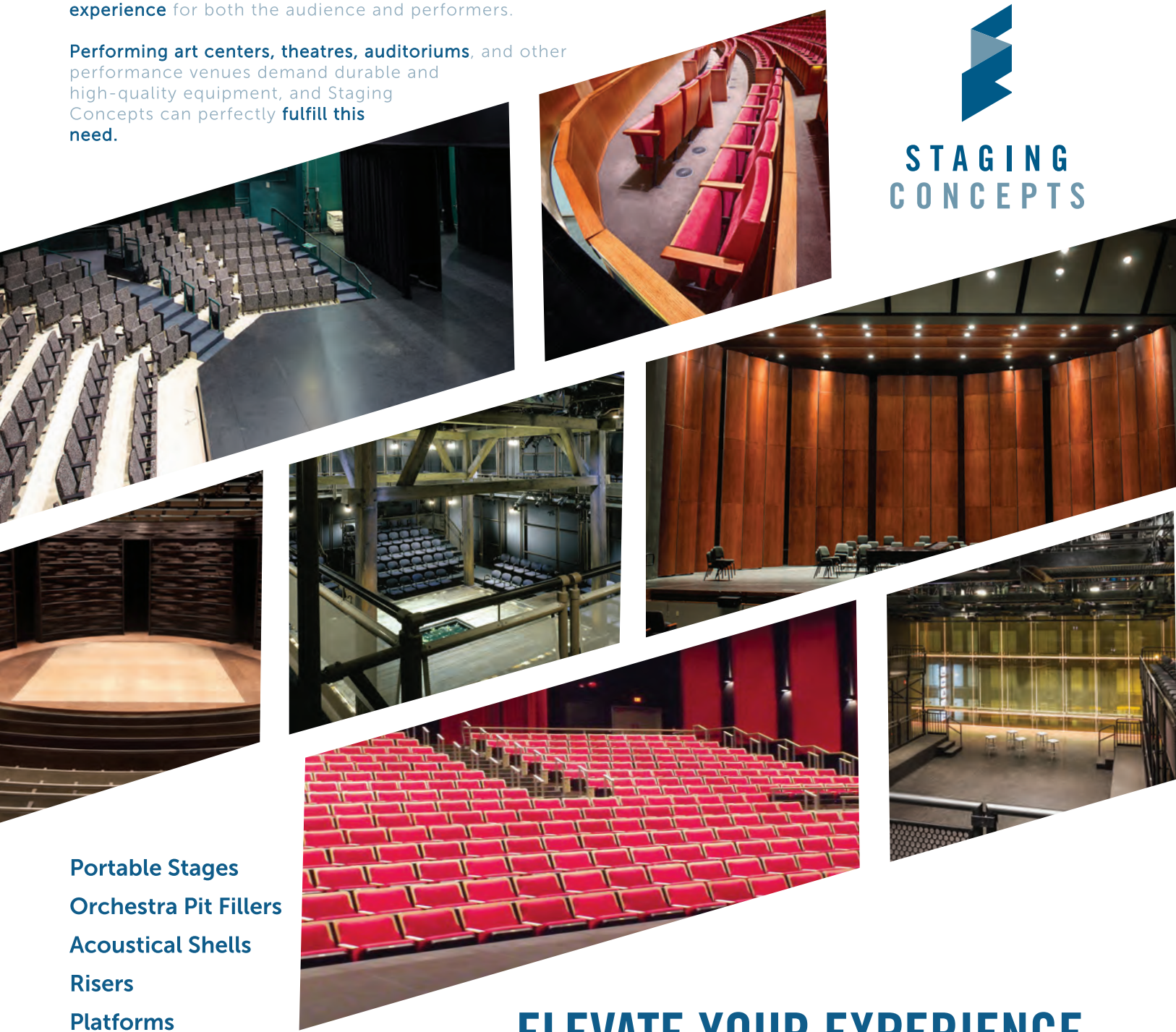
In its first season The Yard has accommodated five productions – and five configurations. "For *The Tempest* we used a large proscenium venue," says Plevin. "But we're also doing a hip-hop adaptation of Dickens' *A Christmas Carol* and the venue will be unrecognizable from the Shakespeare productions. We're pulling the towers closer together and removing the scaffold-deck risers to create a flat floor, reminiscent of the standing area at The Globe in London. We've put in cabaret tables and it feels like a vibrant, intimate music venue." ■

# TAKE YOUR PERFORMANCE TO THE NEXT LEVEL

**Staging Concepts** specializes in building **modular stages** to seamlessly look and feel permanent. Our customization options can maximize the functionality of your space, while giving you the capability to choose a system that **perfectly matches your venue**. **Acoustical shells** can also be custom designed to enhance any performance. Shells consist of towers, ceiling panels, and integrated lighting to form a **resounding experience** for both the audience and performers.

**Performing art centers, theatres, auditoriums**, and other performance venues demand durable and high-quality equipment, and Staging Concepts can perfectly **fulfill this need.**

STAGING CONCEPTS



**Portable Stages**
**Orchestra Pit Fillers**
**Acoustical Shells**
**Risers**
**Platforms**

# ELEVATE YOUR EXPERIENCE

www.stagingconcepts.com

8400 Wyoming Avenue N., Suite 100, Minneapolis, MN 55445 | 763.533.2094

## COVER STORY: FORO BOCA

GUY BIRD

Jaime Navarro/Rojkind Arquitectos

# Waves of sound

A stunningly modern concert hall has been created to provide a seafront home for a new philharmonic orchestra in Boca del Río, Mexico

The dramatic concrete structure that seems to grow out of the breakwater between river and sea at the end of the Coastal Avenue Vicente Fox in Boca del Río, Veracruz, Mexico, started off as the dream of the local mayor, Miguel Ángel Yunes Marquez. In 2014, he had the idea to form a philharmonic orchestra for the town – there had previously been nothing like it – and commission a magnificent concert hall where it could perform. He also envisioned that this space could become a cultural center for the wider populace, rejuvenating its community in the process.

Rojkind Architects won the competition to build a striking and modern facility – Foro Boca or 'Boca Forum' in English – on the 5,410m² (58,000ft²) site. "It was equally important to create an amazing place for the musicians, create a vibrant exterior life with plazas, and recover the breakwater, which had deteriorated," recalls Michel Rojkind, principal architect. "The design emerges from the concrete cubes that form the wave breakers and changes in scale to slowly transition from ocean to city, while the raw concrete finish resonates with the chromatics of its surroundings."

On a technical level, it was important to take the climatic conditions of the location into consideration, creating shelter from the extremely harsh north winds that hit the area. "We decided to protect the access and complete the wave breaker to make the public space more integrated," adds Rojkind.

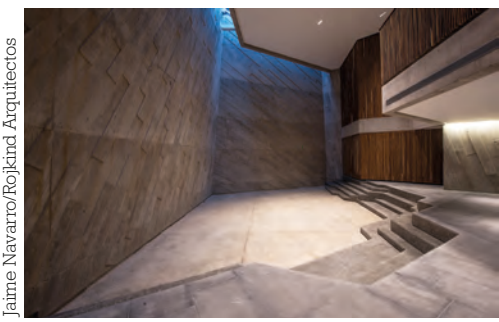
Foro Boca is the first concert hall Rojkind has designed, although he sees similarities with his practice's work for the National Film Archive and Film Institute of Mexico, completed in 2012, which included screening rooms. The remit to create open and inviting cultural spaces around the architecture is one clear parallel.

## Multiple uses

Foro Boca's auditorium is primarily designed for the philharmonic orchestra's concerts and can accommodate an audience of 966. Dance, theater and cinema are also possible in the space. Rojkind worked with Cemex to create a special type of concrete for the internal and

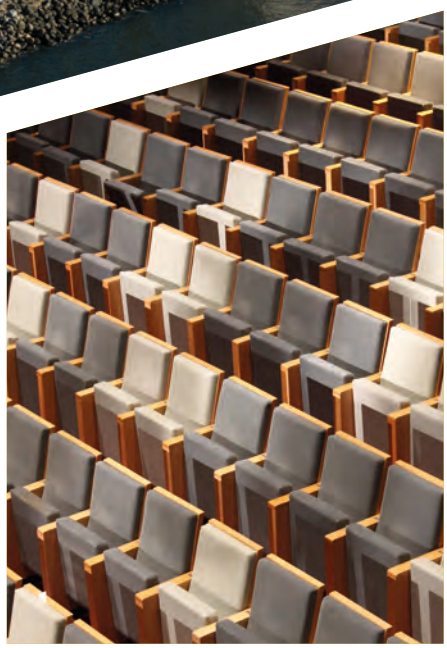
Paul Rivera/Rojkind Arquitectos

Jaime Navarro/Rojkind Arquitectos



Jaime Navarro/Rojkind Arquitectos

Jaime Navarro/Rojkind Arquitectos



Iker Gill/Rojkind Arquitectos

Right: **The building has a raw concrete finish**
Left: **The Sala Mester concert hall seats 966 people**
Center: **Foro Boca is designed to create shelter from the winds**
Bottom left: **The three-story lobby**
Bottom center: **The 150-seat rehearsal hall**
Below: **Seats are upholstered in gray to match the concrete**

Paul Rivera/Rojkind Arquitectos

external walls. The distinctive pattern of 40cm (15.7in)-long wooden planks – which play with 2cm (0.8in) depth variations – was developed iteratively through many mock-ups.

"This vibrant texture plays with the light and location of the venue," explains Rojkind. "The reflective concrete panels on the inside of the auditorium work along with the 'wooden cloud' placed above to maintain a crisp yet controlled sound in the hall."

## Acoustic shaping

The process of optimizing the sound in this space was lengthy. "Every time we moved anything inside the concert hall, we had to re-evaluate the form shaping and its acoustics, but we were collaborating with an amazing team," says Rojkind. Three sound consultants were involved – Akustics, Auerbach Pollock Friedlander and Seamonk. For the exterior, Rojkind says getting some of the deeply cantilevered exterior access points correct and making a connection to the wave breaker nearby involved considerable back and forth with structural engineer EMRSA.

There is also a secondary 150-spectator rehearsal hall, designed for flexibility. "Having the rehearsal hall as an independent space opens up the possibility of having two or more cultural events happening at the same time, with independent access and exits," says Rojkind.

## Support structures

Beyond these two main interior spaces, the back-of-house area primarily supports the orchestra's needs, with rehearsal rooms and a recording studio. There are general changing rooms and private ones for the directors and guest performers, plus an office area and a musical library. Within the public part of the building, the halls are accessed via a three-story lobby with staircases characterized by slatted wood bannisters. The top floor has an outdoor terrace overlooking the river and sea, with a cafeteria and restaurant nearby.

A visual projection system enables those outside to see and hear what's happening in the concert hall. "The idea was to implement exterior video projections along with the audio for free to passersby, so a new audience is growing and learning," Rojkind enthuses.

Although Foro Boca's primary function is as a concert hall, the brief expanded to make

## THE CONDUCTOR'S VIEW

With grand plans for a new concert hall and philharmonic orchestra in place, one vital piece of the jigsaw was missing: a star conductor and artistic director. "Three years ago, they flew me down to convince me to take the job," recalls Jorge Mester, who was born in Mexico City and is based in Los Angeles, California. "They already had an orchestra but needed a conductor. I was shown the plans and mock-up, which I found to be amazingly imaginative, and everything was well underway. I had no input into the building's design."

Mester is delighted with the acoustics he has to play with. "Despite the fact that lots of the walls are concrete, there is a lot of wood in there too and the seat design was thought through regarding sound absorption, so the acoustics are world class," he says. "There are some tweaks that could be instituted if we knew how to manipulate the 'cloud' – which also contains the lighting – above the stage. But even without such manipulation, the orchestra sounds magnificent in there. It can be moved around, but hasn't happened yet. If it ain't broke, don't fix it."

Mester, now 83, flies back and forth from LA to Vera Cruz every couple of weeks for rehearsals and performances, so appreciates having his own dressing room at Foro Boca. "Apparently only I can use it," he says. "That was a lovely gesture on the mayor's part."

He was also touched by the auditorium being named Sala Mester (Mester Hall). "That's an honor; usually I would have to be dead or have contributed millions of dollars to get that privilege," he says, before concluding with a laugh, "Neither of those two things have occurred."

PASSION
BUILT IN

Kling & Freitag balances passion with precision for uncompromising audio quality and 'German engineering'.

We are driven by a desire to provide and technically guarantee music and sound as a genuine sound experience. This is what each product by Kling & Freitag stands for – or, as we say, 'PASSION BUILT IN'.

Kling & Freitag GmbH | www.kling-freitag.com | Harbin Grand Theatre, China


Jaime Navarro/Rojkind Arquitectos

the building and its surrounding plazas more multipurpose, so they could accommodate video installations, theater, lectures, electronic performances, book readings and dance.

"The exterior plazas became an integral part of the project," says Rojkind. "The free music and video projects make it a lively space at night, and in the day the place comes alive with fishermen and people exercising, from yoga classes to cycling and running. We even get people taking wedding photographs outside."

### Cultural outreach

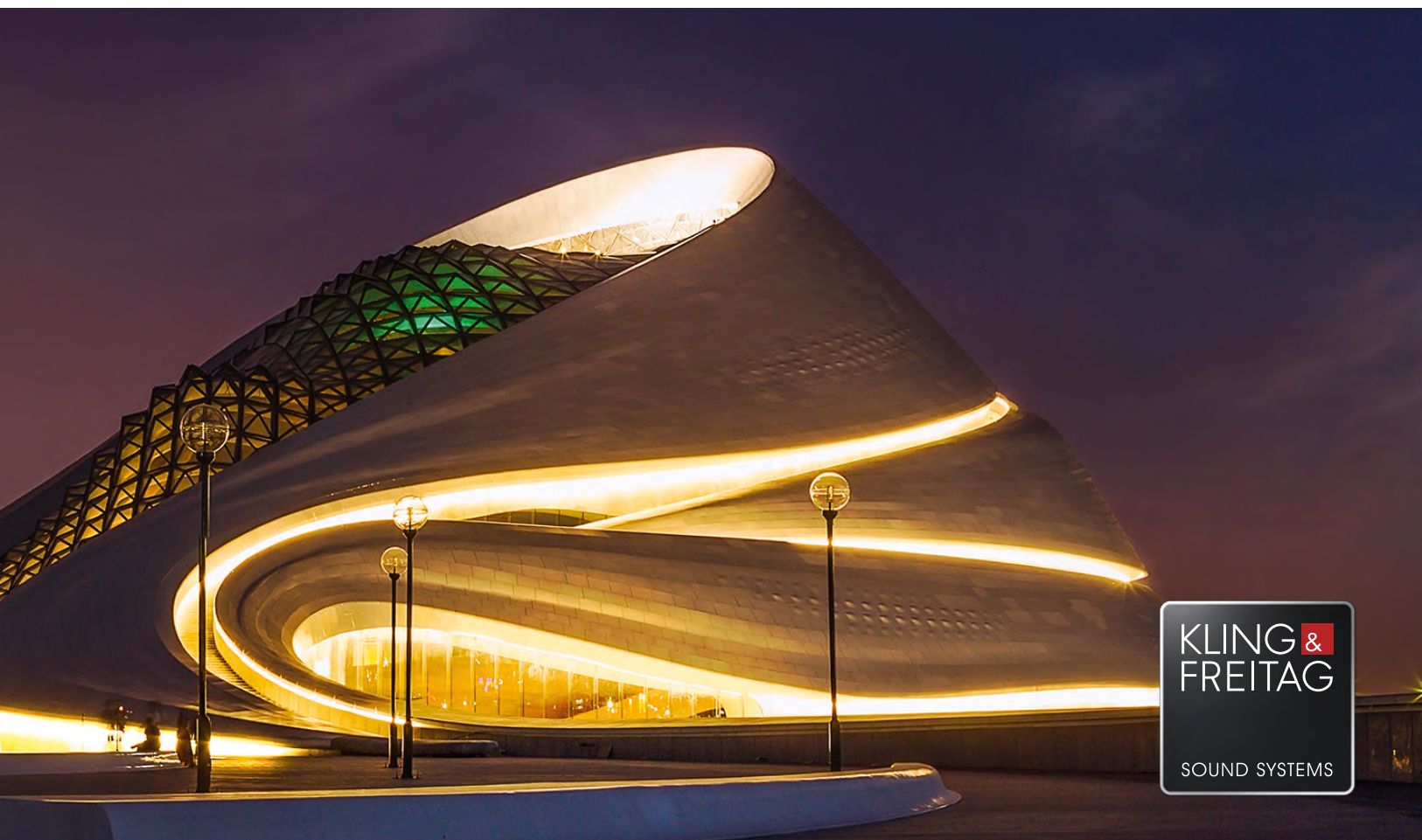
The inclusive feeling extends to an educational outreach program called Orquestando Armonia, intended to get the next generation involved. "This is a particularly noble activity where members of the orchestra teach every day in local schools, and musical instruments are loaned to local children of five, six, seven and eight years old," explains Jorge Mester, conductor and artistic director of the Boca del Río Philharmonic Orchestra. "These kids often live in terrible conditions and have little else to do. The chamber orchestra also plays in retirement homes and hospitals. Foro Boca is a uniting force for the population, under independent management."

## CAST LIST

**Architects:** Rojkind Arquitectos – principal architect Michel Rojkind, project manager Agustín Pereyra
**Structural engineer:** EMRSA
**Acoustics consultants:** Akustics, Auerbach Pollock Friedlander, Seamonk
**Specialist engineering:** Gralte
**Lighting consultant:** Artec3
**Builder:** Ingenieria y Desarrollo Arquitectónico

Foro Boca opened in December 2017, and Rojkind has been back to see how the building works with its orchestra many times, and to see other performers too. "I've really enjoyed going to classical concerts there," he says. "I was fortunate enough to meet [US violinist] Joshua Bell at the opening concert and he gave a very nice compliment on the sound in the hall. It's also great to see the different uses of the place, from movie projections and artists doing light performances, to even a book fair that recently took place inside."

Clearly the dream of Foro Boca being a home for music and much more has been fulfilled. ■



# Fresh ideas

Three venue directors just a year or two into their roles reveal how their visions for expansion, the artistic program and audience engagement are being implemented

Taking the reins of a large venue requires somebody with a range of skills. In some cases, a facility may be steeped in history and an integral part of a community, making it a daunting task for a new director.

David Baile, CEO of the International Society for the Performing Arts (ISPA), has some good advice for new leaders of arts venues. "It's a balancing act of managing the facility and creating a program," he says. "There are a lot of stakeholders – your team, artists, the community – and sometimes they do not all have complementary needs, so you have to have a vision that can balance the needs of everybody and be responsive to everybody's voices."

Baile says new directors are sometimes too keen to make big sweeping changes and stamp their own authority on a venue, which is something he believes can be a mistake. "So many people go into an organization wanting to change the world immediately," he says. "It is important to get a handle on the history of the place, who the community is, and who the players are, before you make any changes. You need to get a sense of the big picture."

He says a good example of a director understanding the community around a venue was when Anthony Sargent became the first chief executive at the Sage in Gateshead, UK. "He came into a community that had not been arts focused, but by becoming a concert hall it also became a hub for the community and is having a profound effect on the lives of the public both through the arts and as a community center," says Baile.

And of course, new leaders in the arts sector are not alone. "At ISPA, we facilitate networks of arts leaders around the globe," says Baile. "The arts community is close, and like any industry, it contains people who share common experiences, and there can be a lot of crossover, especially with people who work internationally."

> "There are a lot of stakeholders – your team, artists, the community – and sometimes they do not all have complementary needs, so you have to have a vision that can balance the needs of everybody and be responsive to everybody's voices"
>
> **David Baile, CEO of ISPA**

**David Baile, CEO of ISPA**
Christopher Duggan

## MARY LOU ALESKIE

**Director, Hopkins Center for the Arts, Dartmouth College, New Hampshire, USA**

Judy Sirota Rosenthal

As an Ivy League school, Dartmouth College already had a thriving performing arts scene, but new director Mary Lou Aleskie, has arrived at a time of change for the New Hampshire university. "There is a very big capital investment campaign going on at the moment and performing arts will be a central component of that," says Aleskie, who took the reins of the 'Hop' in April 2017.

The campaign is hoping to raise US$3bn, and Aleskie says US$75m to US$100m of that is earmarked for Hopkins. "It is a mid-century building, so it is due a refresh," she says. "I think what it needs are all the things you look for in a 21st century building."

One of her ideas is to create a 'light box' – a black box performance room with a transparent side. She also wants to add an extra 25,000ft² (2,300m²) to the lobby, which she plans to use as a flexible space for cabaret and other performances.

As former director of the International Festival of Arts & Ideas, as well as current chair of ISPA, Aleskie has produced critically acclaimed performances that have fostered local as well as international engagement, and this internationalism is something she wants to expand to Dartmouth. "We are already the major arts center for New Hampshire, but it is time for the arts community to become international as well," she says.

To achieve this, Aleskie is encouraging global artists to come for residencies at Dartmouth, and she is also encouraging them to collaborate with the academics at the college as part of a vision to "unite the branches of arts, science and the humanities".

Artists have collaborated with the college's Arctic Institute to highlight global warming, and there have also been collaborations with the Environmental Science Department focusing on the plight of vanishing trees. "This is the kind of thing we will be doing more of," reveals Aleskie. "We want to collaborate with artists around the globe and really put Dartmouth on the global map."


Robert C Strong II

## CRAIG HASSALL

**Chief executive, Royal Albert Hall, London, UK**

Taking charge of any venue is daunting enough, but when the venue in question is nearly 150 years old, steeped in history, and one of the most celebrated performing arts centers in the world, a steady hand is needed to take the helm.

Craig Hassall became chief executive of the Royal Albert Hall in April 2017, and while his resumé includes such prestigious posts as CEO of Opera Australia, and before that CEO of the English National Ballet, he has never run a performing arts venue before.

"I hadn't run an actual venue before, but I'm really enjoying learning all about toilets," jokes Hassall. "Seriously, it is a very resource-hungry place, and while I've always known the building from my time at the National Ballet, it has been fascinating learning about everything behind the stage."

While Hassall may be learning on the job about running an actual building, his background made him the ideal choice for the role. "I suppose I was chosen because the Royal Albert Hall wanted to focus more on producing performances than just being a building for hire," he says.

Home to the BBC Proms and Cirque du Soleil, until Hassall's arrival in April 2017, only 11% of the Royal Albert Hall's annual 390 performances were put on by the venue itself. "They wanted to change that ratio, and so far we've got it up to 18%," says Hassall.

The venue is also soon to celebrate its 150th anniversary, in 2021, and Hassall has plenty of grand plans to mark the occasion. "One of the big things I want to do is bring the sound in-house," he says. "Currently, hirers bring their own sound equipment, but this means the sound can vary. By bringing it in-house we can make sure the sound is always suitable for the Royal Albert Hall."

The venue may be a historic, iconic London landmark, but this hasn't stopped Hassall from making structural changes to the building. "We are digging the basement in the southwest quadrant," he says. "The idea is to take people and equipment out of the building that way, which will free up backstage space. It will also let us create a whole new space for the public, creating a living archive so people can experience music from every decade."

Hassall also wants to expand the venue's use during the day. "In the evening, we are already at 90% occupancy, but by opening in the day, people can come for a glass of wine or see an exhibition," he says. "We already run tours, but opening during the day will let us do more of that sort of thing."

Harrison Truong

## CHRIS LORWAY

**Executive director, Stanford Live, Stanford University, California, USA**

Situated in California's Silicon Valley, Stanford University is more commonly associated with providing talent for big tech companies such as Google than as a thriving performing arts community. That all changed when the university appointed Chris Lorway as executive director of Stanford Live, which puts on performances at the campus's Bing Hall.

While Stanford Live was in its fifth season, performing arts had taken somewhat of a back seat until Lorway took over in July 2016. "I think they had developed a classical music program, mainly chamber music, and held 40 to 60 events per season," says Lorway. "But we have always been a feeder school for the big tech companies, so the focus has been on science programs and the arts and humanities have somewhat got left behind."

However, Lorway's appointment coincided with a shift in leadership at the university, something which Lorway says contributed to more emphasis on performing arts. "The new president understands that arts and humanities can help put other work in context," he says.

To complement the 842-seat Bing Hall, the campus is renovating the Frost Amphitheater, a tree-lined bowl next door – a space that definitely suits Lorway's festival background.

A native of Cape Breton, Nova Scotia, Canada, Lorway was the founding artistic director of Toronto's internationally recognized Luminato Festival and has also worked on the Lincoln Center Festival, the New Yorker Festival, and was part of the founding team of the Celtic Colours International Festival in Nova Scotia.

"My background in festivals is an advantage because people that have a background in concert halls are more specific – they may be an orchestra specialist, for instance – but with festivals you have a different environment and you look at your assets and work out how to exploit them," he says.

A big change Lorway made was to use the entire building. "I've looked at every nook and cranny to see how it could be used, and we've done a number of configurations, from turning the rehearsal rooms into a nightclub, putting on cabaret and jazz, to reconfiguring Bing Hall to use it for pop music," he says.

Lorway has also tried to contextualize the arts program more, using current topics and themes to engage the academics and students, without forgetting what makes Stanford Stanford.

"Technology is obviously something we want to exploit," he says. "We want to try everything. We are currently looking at Google virtual reality and augmented reality, taking advantage of the technology on the campus. We want to encourage people to experiment and try new things." ■

Joel Simon

ISPA International Society for the Performing Arts

# NEW YORK CITY 2019

## New York City 2019 ISPA Congress

## January 8-10, 2019

Join us in New York City to exchange and develop ideas, strengthen and create relationships, and see new works before they enter the international market.

# Save the Date



Photo of Ayodele Casel: Christopher Duggan

## www.ispa.org

Congress registration opens September 4, 2018.
Use code ***ny19auditoria*** to receive 10% off a full pass.

# Multiple choice

Clever architecture and well-thought-out acoustics have enabled a new Guangxi venue to stage a range of events in its three halls – even at the same time

**Nanning's new Culture and Art Centre incorporates three halls to accommodate various musical performances**

The city of Nanning, in Guangxi region, China, has built a new Culture and Art Centre. The complex consists of an 1,800-seat opera house, a 1,200-seat concert hall and a 600-seat multipurpose auditorium. It includes rehearsal rooms, dressing rooms, workshops and more, enabling the staging of a range of artistic performances at the highest level.

Plans for the facility were drawn up following an architectural competition that attracted leading architectural practices from around the world. The contract to design the new structure was awarded to gmp from Hamburg, Germany. The architectural and structural acoustics, as well as the planning of the AV system, were contracted to German firm Müller-BBM. The idea behind having just one planner involved was to ensure better interface management and greater synergies.

To avoid cost-intensive acoustic separation of the three halls when they were scheduled to be in use simultaneously, gmp designed them as single buildings above a common basement. This natural separation made it possible to use simple build-ups and even to avoid floating constructions in most areas of the various floors. Each building has a separate foyer leading into the performing space. They are connected by a common platform that offers a stunning view of Nanning.

## The horseshoe

The Opera House is designed as a modern interpretation of the traditional horseshoe shape,

to ensure perfect sightlines and direct sound distribution for each of its 1,800 seats. It features the latest in stage technology, designed by Kunkel Consulting of Germany.

The interior walls feature wood veneer clad to MDF panels, and have a minimum mass exceeding 40kg/m² (8.2 lb/ft²) to ensure the reflection of the low frequencies. The technical equipment necessary to run shows is mostly hidden from the audience. The lighting bridge for scene lighting is integrated into a large canopy inside the ceiling above the audience. The loudspeakers are a full set of high-power integrated steerable line sources and special very slim subwoofers inside the proscenium arch. This means that a great-sounding full-power sound system is available at any time without resetting loudspeaker systems.

A top-class digital sound mixing desk has been installed in the control room. For video images, a large-format video projector has been installed, with different selectable image sizes.

## Acoustic results

The Opera House's reverberation time, when occupied, is designed to reach 1.8 seconds. Measurements from May 2018 show that this was achieved. The variance between occupied and unoccupied measurements was less than 0.2 seconds, thanks to the chairs selected. An optimum balance between the orchestra inside the pit and the singers on stage is achieved in the audience area by reflections inside the proscenium area, which force the singers to overcome the musicians for a balanced sound.

Images: Christian Gahl, Berlin

The architectural design of the concert hall, meanwhile, follows the basic design of the classic shoe box. After decades of development and optimization in the field of concert hall construction, this classic form has emerged as acoustically optimal. The Nanning Concert Hall, designed in this way, and being geometrically perfect, is characterized by unique sounds.

Above: **The Opera House, which has a reverberation time of 1.8 seconds**
Below: **The Concert Hall has a classic shoe box design**

## Concrete solution

Wooden cladding was to be used for the walls, but fire regulations in Guangxi meant that glass-fiber reinforced concrete (GRC) had to be used instead, and covered with Japanese wood veneer to give the appearance of a wooden hall.

The reverberation time is 2.1 seconds in the mid frequencies, an optimum range for a concert hall of this size. Due to the heavy mass of the hall's boundary surfaces, the low frequencies increase by 0.3 seconds, giving a warm sound.

For the sound system, a top-class sound mixing board was installed, along with a sophisticated multitrack recording system with a high number of microphones. Different loudspeaker systems are available.

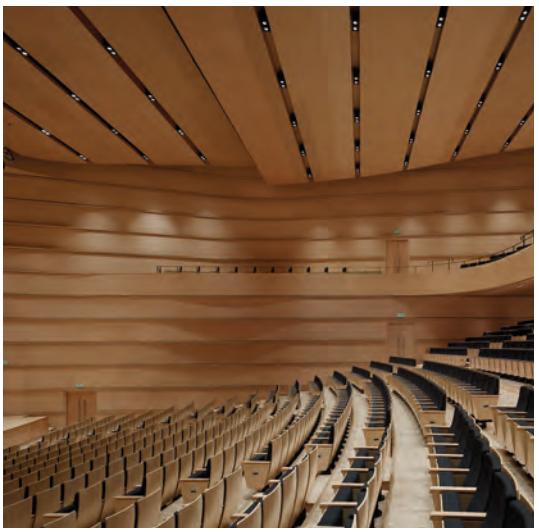
## The black box

The multipurpose auditorium was designed as a black box. Retractable seating was installed to facilitate a wide range of shows.

The architectural acoustic for this hall was planned as a variable acoustic, to match the flexibility of the hall. Thus, the reverberation time was set at its lowest levels for all performances, at about 1.0 seconds. Any necessary increase in reverberation will be carried out with the help of a Vivace electroacoustic enhancement system.

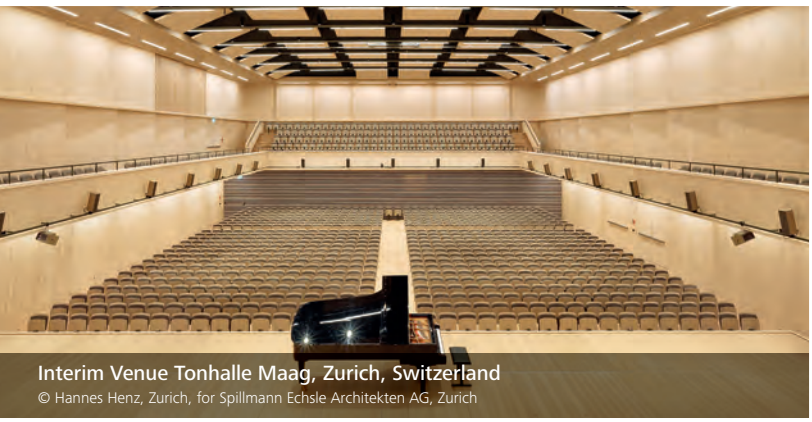
The multipurpose auditorium is equipped with a multichannel loudspeaker system which enables full sound reinforcement within any of the different room settings. All channels are freely configurable. The loudspeakers themselves are installed out of sight, behind acoustically transparent wall material. The digital sound mixing desk can be reset in seconds for any room configuration. ■

**www.muellerbbm.com**



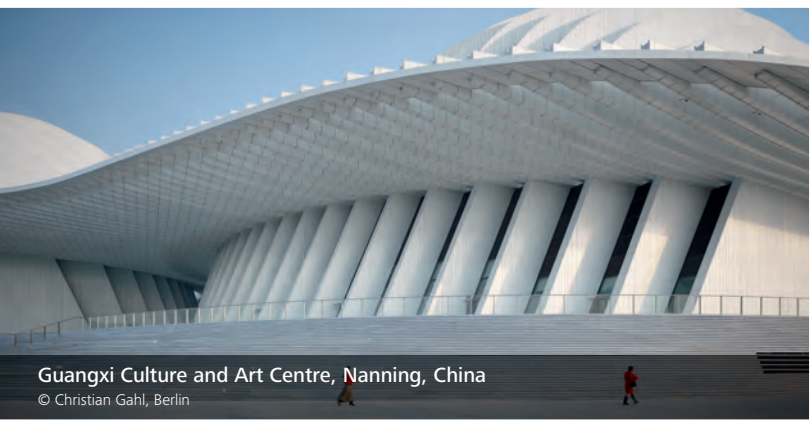
# MÜLLER-BBM

Müller-BBM GmbH, Planegg, Germany
© Massimo Fiorito, Munich

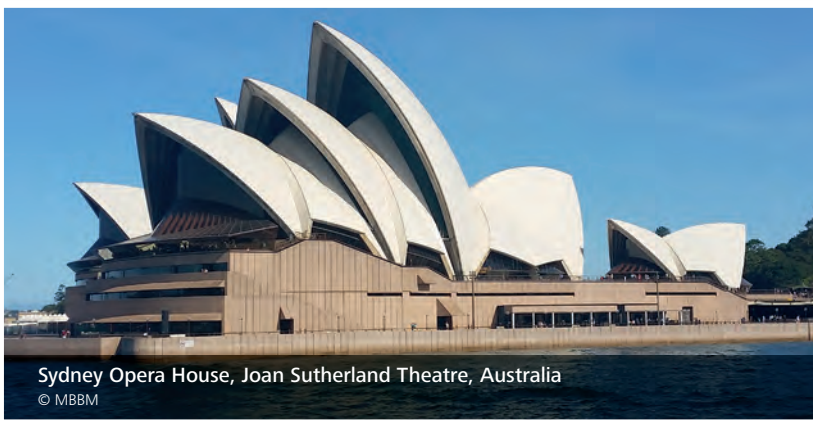


Interim Venue Tonhalle Maag, Zurich, Switzerland
© Hannes Henz, Zurich, for Spillmann Echsle Architekten AG, Zurich

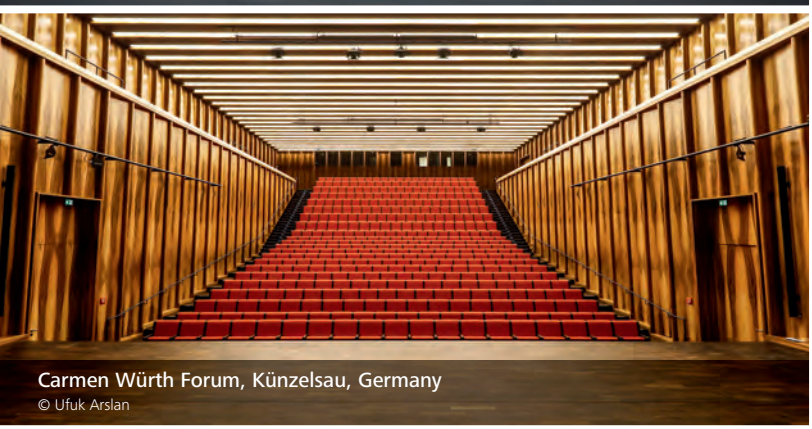
LAC Lugano Arte e Cultura, Switzerland
© LAC 2015 – Studio Pagi



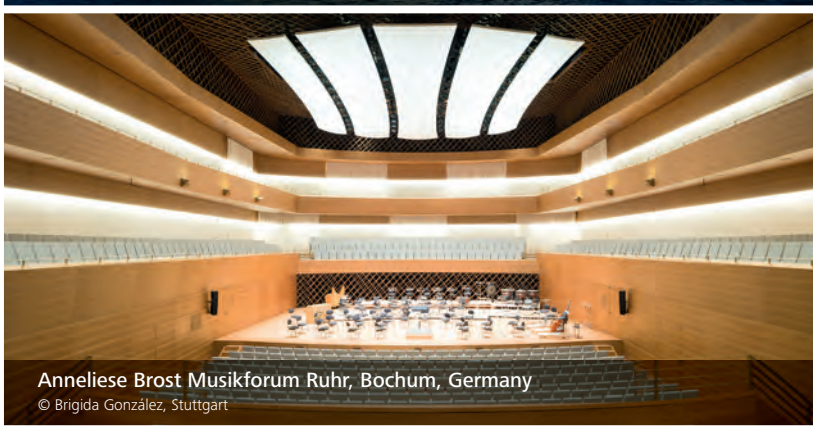
Guangxi Culture and Art Centre, Nanning, China
© Christian Gahl, Berlin



Sydney Opera House, Joan Sutherland Theatre, Australia
© MBBM



Carmen Würth Forum, Künzelsau, Germany
© Ufuk Arslan



Anneliese Brost Musikforum Ruhr, Bochum, Germany
© Brigida González, Stuttgart

Müller-BBM GmbH
Robert-Koch-Strasse 11 · 82152 Planegg/Munich · Germany · Phone +49 89 85602-0

www.MuellerBBM.com

# Personal space

Bespoke seating systems play a crucial role in enhancing the quality of an audience's theater experience

The aesthetics and functionality of an event space play a big contributing factor in creating an individual's overall impression of the experience. If a person finds themselves sitting in an uncomfortable posture too close to the person next to them, or the overall volume of the show is unreasonable, this will greatly impact their enjoyment and venue experience.

Ensuring both of these elements are adequately managed is a key focus for SIS Global Seating, which dedicates the design, manufacture and installation of its seating systems to improving the experience of every person in the audience. Through its involvement with the Figueras International Seating Group, SIS Global Seating is part of a group that has been able to provide some of the world's most iconic venues and auditoriums with seating solutions that enable guests to sit back and enjoy the experience.

## Bespoke approach

This is due to what Mark Cowley, director at SIS Global Seating, believes is an entirely bespoke approach. "While becoming part of the Figueras International Seating Group has enabled us to draw on more than 170 combined years of experience in producing the highest quality in auditorium seating solutions, it is how we tackle each project that really enables us to home in on the specific requirements of each client," he says. "The dedication to ensuring we adequately meet each venue's specific needs is reflected in our latest product, Venu, which combines unlimited adaptability with groundbreaking design to create a unique and multipurpose audience seating product that sets a new standard in versatility and individuality."

Designed to meet what the company feels are the ever-changing needs of the auditorium sector, the seating system facilitates flexibility for use on fixed tiers, retractable chair platforms and flat or sloping floors. This completely rejects the 'one size fits all' approach, considering every detail to ensure not only that the audience has the best possible experience, but that the seating fulfills the demands of the venue.

The seat's chassis is constructed from a metal replacement composite, Dura Z, which the company says provides a compact green design, superb ergonomics and a streamlined aesthetic.

Above: **Comfort and sightlines were the driving variables in the construction of Home**
Opposite page: **New seating at the BBC's TC1 Television Centre was upholstered in a custom shade, Matador, to reflect BBC branding**

## MAKING THE AUDIENCE FEEL AT HOME

The recent construction of the new cultural center, Home, in Manchester, UK, brings together some of the city's best-loved arts organizations, providing residents and visitors with a hub of theaters, cinemas, a gallery and a restaurant for a truly immersive experience.

With so many venues in a single construction, unique seating systems were required to offer a unified yet fresh feel. SIS Global Seating worked with the architect and the client to design, manufacture and install 1,023 seats to meet every requirement.

Throughout the five cinemas, comfort and sightlines were the two driving variables. While some areas were limited by ducting – meaning some concrete levels required tiering to achieve a variable rise per row – others required a radial design to enhance the feeling of space. In the three smaller cinema rooms, a more intimate space was created through the installation of seats with arms.

In the live performance theater, the challenge was to manufacture and install job-specific tiers that would form treads and seat risers into a radial layout for the lower and upper circles.

This was achieved by SIS Global Seating creating individual seating systems that were unique for each area of the venue. Both seating systems in the cinema and theaters were upholstered in five different colors to create a striking visual, while fabrics were selected to ensure durability and comfort.

Adam Scott

Above: **Cherry red upholstered seating at the Royal Academy of Music in London offers a touch of opulence**

The design also means that audiences will be able to enjoy a comfortable sitting experience without the need for fabric. By eliminating this requirement, any potential rips or tears are prevented and maintenance is kept to a minimum, making it a great solution for busy multipurpose venues.

## BBC TC1 Television Centre

One recent project saw SIS Global Seating supply a new seating system at the BBC's iconic TC1 Television Centre in London, a solution that had to mirror the prestige of the organization.

With the space fulfilling multiple needs, an adaptable solution was required. SIS Global Seating was commissioned to install a robust retractable system of 600 seats, which can create as much or as little space as required.

The bespoke approach was also taken with the upholstery. The seating system was upholstered in customer-selected fabrics, in the custom shade of Matador – reflecting the BBC's iconic branding and creating an impressive visual impact against the retractable platforms. As well as offering both style and substance, the material was selected for its durability.

"Our recent BBC installation was a fantastic opportunity not only to offer bespoke shades, finishes and styles, but also a completely unique system that had been designed to suit the interior space," says Cowley.

Another project in which the group had its skills put to the test was in the supply of seating for the renovation of the Royal Academy of Music in London, UK. As part of the high-profile project, which saw the theater shortlisted for the 2018 RIBA Awards and named as a finalist for the 2018 WAF Awards, the group was commissioned to install more than 300 seats throughout the refreshed main auditorium. The solutions not only had to support the acoustics of the venue, but also provide the highest standard in comfort and durability.

Fulfilling these requirements once again required a bespoke approach, combining unique designs and structural properties with individual shades and finishes. Selected to offer patrons a comfortable and enjoyable experience, the cherry red upholstered seating offers a touch of opulence, while its structural design supports the acoustic properties of the interior.

As expectations and sitting technologies continue to transform, so too must the design and adaptability of the space. More than ever, venues are transitioning into multifunctional landscapes and shrugging off the stereotypes of the past. However, they can only fulfill this with the addition of bespoke and adaptable seating solutions. ■

**www.sisglobalseating.co.uk**

# The best seat in the house


Our renowned and innovative seating solutions suit auditoria and theatres to the letter.

Stylish and comfortable enough to create a welcoming environment, they're also robust and durable enough to withstand the rigours of thousands of daily visitors.

With an ever expanding global portfolio, and hundreds of proven installations worldwide, SIS continue to set the auditorium seating standard.

To find out more, email **sales@sisglobalseating.com**

Specialists in seating

www.sisglobalseating.co.uk

**DESIGN**
MARTINEZ+JOHNSON ARCHITECTURE AND SCHULER SHOOK

# Icon invigorated

A 140-year-old US icon has been brought into the 21st century – but catering for Cincinnati Music Hall's varied users was a challenge

**Cincinnati Music Hall following a successful US$143m revisioning that retained historical features**

Images: Whitney Cox

Cincinnati Music Hall – the very name evokes visions of the dominating presence this 140-year-old icon has in the performing and cultural arts scene in the USA. Home of the Cincinnati Symphony Orchestra, Cincinnati Pops Orchestra, Cincinnati Opera, May Festival and Cincinnati Ballet, it is one of the oldest, largest and most influential performing arts institutions in the country. All these entities share the primary performance venue, Springer Auditorium, and thus Music Hall is subject to the widely varying programmatic demands of each art form – a challenge of constant adjustment to the needs of each company.

And yet Music Hall has successfully responded to the needs of each resident member, incorporating new art forms, technologies and performance demands throughout its storied history. The most recent effort to accommodate such changes concluded with the successful execution of a US$143m revisioning of the entire facility. With a focus on Springer Auditorium, this challenging undertaking resulted in the reopening of Music Hall in October 2017 after 16 months of construction.

In an intense collaboration with Schuler Shook theater planners and Akustiks, Martinez+Johnson Architecture initiated an approach to the revisioning of the hall that recognized and highlighted the essential character-defining elements of Springer Auditorium while retaining many of the historical features of the hall.

## Moving the orchestra

Challenges facing the team included the extensive seating reconfiguration necessary to reduce acoustic volume, the reshaping of the walls to retain and enhance the widely recognized warmth and fullness of instrumental performances, and repositioning the Symphony Orchestra to a downstage location in front of the proscenium arch.

The latter challenge set it almost completely inside the audience chamber. This resulted in having to raise the seating in the balcony and gallery levels to a sharper degree of slope, thus enabling full sightlines with views to conductor Louis Langree's downstage podium. The combination of the steeper slope on the seating areas, which extend down the sidewalls to the proscenium arch, along with a vantage point that is virtually over the orchestra, establishes an unequaled intimacy and presence from the patron's perspective.

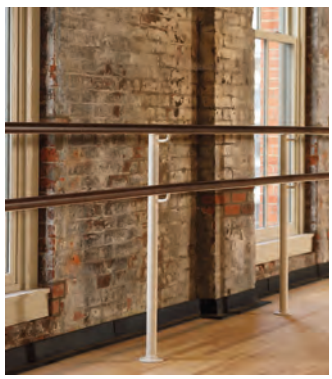
In response to the multi-use nature of the hall, particularly for the Symphony and the Opera, the sightlines throughout the hall received extensive study and detailing. Balancing the visual sightlines of the Opera with the acoustic 'soundlines' of the Symphony led to the demolition and rebuilding of the entire orchestra level. Sculpted box seating extends to the leading edge of the largest pit (or raised stage) configuration.

The slope of the orchestra floor is established not only by the acoustic demands of the Symphony, but also by those of the Opera. Accommodating the necessity for exits at the preset elevations of the existing hallway alongside Springer Auditorium led to the relocation of the mid-room cross-aisle and the creation of raised parterre seating at the rear of the hall, further improving sightlines and the sense of intimacy.

Two original orchestra pit lifts were replaced and a third was added to extend the stage apron for the Symphony. The new lift can be lowered to expand the orchestra pit for opera or to support audience seating wagons for Cincinnati Pops, ballet and other programming. When not in use, the seating wagons are housed in a dedicated storage bay that was excavated below the orchestra floor and supply air plenum.

The stage extension also required a new forestage acoustic reflector, custom designed to serve the varied performance program of the venue. The forestage panels will support both the musicians on stage and reflect sound to the audience. However, the panels also needed to be easily adjustable, removable and aesthetically complement the existing architecture. The design of the panels enables them to be lowered to the floor, stacked on special carts, and hoisted to an upper remote area of the fly house.

Above and opposite page: **The slope of the orchestra floor was designed to suit both the Symphony and the Opera**
Above right: **New torchère lighting highlights the coffered ceiling of the Grand Foyer**
Top right and below: **The second floor has a new flexible rehearsal/event space**



Illumination for the musicians is provided by theatrical lighting fixtures between the ceiling panels. The translucent ceiling can also be illuminated for Pops events or flown out of the way for other shows during the Symphony season. The ceiling panels are light in their visual expression and allow the architecture to be present around and through the panels.

## Technical flexibility

The hall's technical systems required a balanced approach to meet the needs of the primary user groups, and to be flexible for touring performers and future technologies. The design called for a robust backbone of power and data throughout the building to accommodate the needs of the various productions. New box boom and balcony rail lighting positions were carefully incorporated into the existing architecture.

In completing the room, contemporary sensibilities applied to the seating, the wood flooring and the finish treatment of the surrounding walls and ceilings to establish a balanced counterpoint to the historical detailing of the proscenium arch and surfaces of the balcony fascia, which remain in the hall. Both texture and palette are employed to assert an atmosphere of warmth and intimacy. The polychromatic décor enhances the architectural presence of the space without distracting from the performances on stage. ■

**www.mjarchitecture.com, www.schulershook.com**

# Sounds palatial

An 80-year-old theater in Manhattan needed to be brought up to date with its first real sound system

Once upon a time, movie theaters were truly palaces, and few were equal to Loew's five lavishly designed 'wonder theaters', built in and near New York City in 1929 and 1930. While there are efforts underway to restore several of these opulent octogenarians that have been in and out of commission over the years, Loew's 175th Street Theatre – today known as United Palace – has remained in almost constant use since day one and now has a new L-Acoustics sound system that will carry the venue into its next century.

Located at West 175th Street and Broadway in Upper Manhattan, the facility continues to stay busier than ever hosting church services, theatrical productions and music concerts. United Palace is also home to two non-profit cultural centers: United Palace House of Inspiration (UPHI), an all-inclusive spiritual center, and United Palace of Cultural Arts (UPCA), an independent, nonprofit arts and cultural center.

## An alternative to rental systems

In September 2017 Boston's Audio Spectrum installed an L-Acoustics system in the theater. It comprised 20 K2 array elements and six K1-SB subs divided into two flown arrays, eight SB28 ground subs, four X8 coaxials used as front-row fills, and 12 LA8 amplified controllers to power them all.

Jed DeFilippis has been technical director and production manager at United Palace for a little over 18 months, but in that time has soaked up its history as well as its technical requirements. "It was repurposed as a church in 1969, after Reverend Ike [Frederick J Eikerenkoetter II] bought it," he recalls. "But after he stopped preaching they began to bring in promoters and events to help support the building. It had a tiny PA system – only good for a single person speaking – so most of the promoters brought their own sound systems and rigging with them.

"After I got here I suggested we buy our own rider-friendly PA and rigging, which we could rent to those same promoters. We would also get a return on the investment and make it easier for the event producers, who wouldn't have to rent outside systems, and on the building, which wouldn't have the wear and tear that bringing in rental systems can cause. Robert Way, our COO, was immediately eager to put together the ROI research, so we started considering potential upgrade options."

As the former technical director for Caesar's Entertainment in Las Vegas, DeFilippis first encountered L-Acoustics when he heard the V-DOSC system used in the Paris Theatre for Barry Manilow, ultimately transitioning it over to the RIO Theatre for Penn & Teller. "That system was powerful, durable and sounded great," he comments.

As it turned out, Audio Spectrum, one of the companies that used to bring rental systems into United Palace to support productions there, is an L-Acoustics vendor.

**Aventura's 2016 reunion concert residency at United Palace on Audio Spectrum's K2 rig helped prove that it was the right choice for the venue**

Left: **United Palace's production crew with the K2 system. From left to right – technical director/production manager Jed DeFilippis, lead audio Tuto Tavaras, lighting technician Josh Zettlemoyer, technology supervisor Kevin Calderon and audio assistant David Mazur**

"Rafael Jaimes, principal at Audio Spectrum, knows the Palace well and said that K2 would be the perfect system for this room, and it is," notes DeFilippis. "The perception of the Palace is changing, being increasingly regarded as a great concert venue, and by bringing a rider-friendly PA like K2 in, we're helping to promote that perception."

Indeed the neighborhood, once considered rough-and-tumble, has been gentrifying, paving the way for a renaissance with the Palace as a gem in its crown.

## Balancing the balcony

The K2 system solved another issue for the venue. Its massive balcony, divided into an upper and lower loge and a main balcony, hovers over a huge swatch of the orchestra-level seating in the 3,400-seat theater. The rear sections of both levels were difficult for sound to reach.

K2 and L-Acoustics' Panflex system, a unique horizontal-steering technology that combines mechanically adjustable fins with DSP algorithms effective from 300Hz, quickly resolved that problem. Narrowing or widening the horizontal directivity of the adjustable fins can serve many purposes, including, in this case, adapting the throw to fit long and short distance coverage/SPL requirements, while avoiding reflective surfaces.

"Now we get the sound all the way to the back wall of both levels, clearly and evenly," says DeFilippis. "An L-Acoustics engineer came in and did the tuning in a matter of hours after it was installed. Amazing."

## Sound modeling

Jaimes says the K2 arrays are well suited to United Palace's specific needs: "We used L-Acoustics' Soundvision modeling program and its predictions were very accurate," he notes. "We knew we would be able to completely and consistently cover the rear seats of the orchestra and balcony areas."

Even though he had done shows there as the sound reinforcement vendor in the past, and knowing the venue helped, Jaimes was still pleasantly surprised that the system installation took well under a week and was ready for the show Nick Cannon Presents: Wild 'N Out Live! on September 8. "The K2 has a ton of horsepower and can reach way back, but it's also a very straightforward system to install," he says. "But at the end of the day it's about the sound – and the K2 always sounds great." ■

**www.l-acoustics.com**

Below: **From left to right – Audio Spectrum system engineer Yony Altun, principal Rafael Jaimes and business manager Luis Jaimes with the K2 system on tour with Nick Cannon Presents: Wild 'N Out Live!**

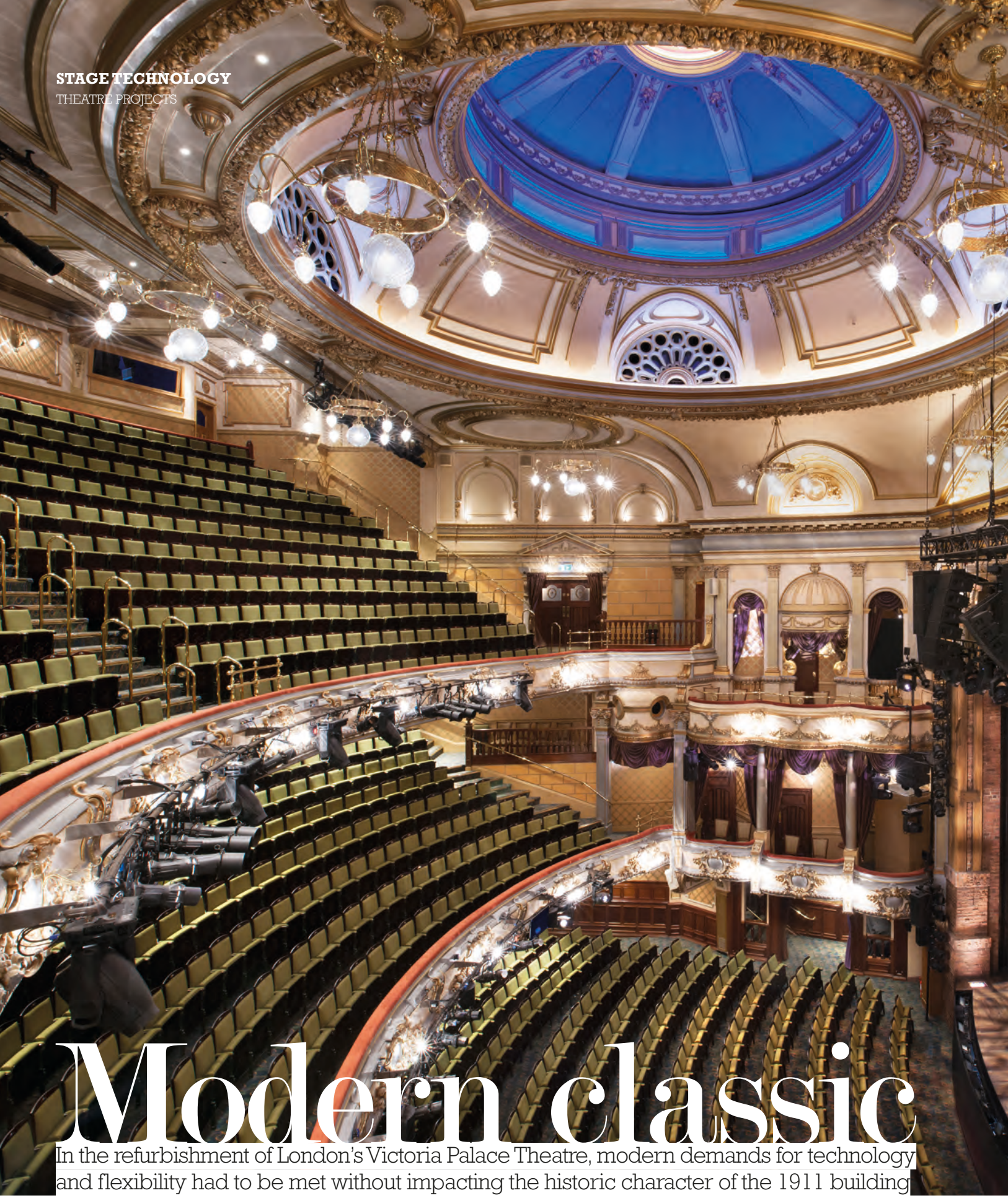
# LEARN MORE ABOUT OUR ADVERTISERS **NOW!**


FREE SERVICE!

Visit **www.ukimediaevents.com/info/aud** to request exclusive and rapid information about the latest technologies and services featured in this issue

auditoria

www.ukimediaevents.com/info/aud



# Modern classic

In the refurbishment of London's Victoria Palace Theatre, modern demands for technology and flexibility had to be met without impacting the historic character of the 1911 building

Photos: Philip Vile

When Delfont Mackintosh Theatres refurbishes one of its West End venues, it's done thoroughly. Chairman Sir Cameron Mackintosh ensures that not only do the public spaces get a makeover, but the stage, technical and back of house facilities are upgraded as well.

When Delfont Mackintosh acquired the Victoria Palace Theatre in 2014 the challenge was greater than anything it had achieved at its other theaters. Theatre Projects joined the team in August 2015 to provide equipment design for new production electrics, dimming, sound, communications and video infrastructure, a trapped stage floor, safety curtain, counterweight flying, and front of house rigging. By this time Cameron's regular collaborators, architects Aedas Arts Team and consulting structural engineers Conisbee, had developed an ambitious scheme for the theater. Working with project managers Buro Four and services engineers Buro Happold, the team proposed major improvements to the auditorium and front of house with new seating and new finishes throughout.

## Adaptability and aesthetics

The theater had been home to *Billy Elliot* for more than 10 years and the 1911 Frank Matcham house was looking decidedly shabby. Aedas's lead architect, Julian Middleton, had a novel approach to reworking the building to meet the expectations of contemporary audiences and modern musical theater: "We placed ourselves in the mind-set of the original architect to understand how he might have approached the design challenges of today," he explains. "Creating the required adaptability in an auditorium where finishes are highly decorative and historically important was a particular challenge."

The auditorium lighting bars and facility panels have been designed to integrate with the fine finishes and ornate plaster. The circle front bars and other lighting positions are installed in an attractive architectural metalwork with a loading capacity of 100kg/m (67 lb/ft) to accommodate the heaviest equipment. The facility panels are compact, using multi-pin outlets where possible; installer LSI Projects provided bespoke panel sizes and colors to coordinate with the interior design. "It was a challenge to the team to provide the necessary equipment positions while ensuring the auditorium looks neat and beautiful," says John Riddell, Theatre Projects' lead.

## Stage depth

With the venue came a 6m (19.7ft) strip of land immediately upstage of the back wall, so Cameron planned to increase the stage depth to 15m (49.2ft) to make it one of the deepest in the West End, raise the grid to 21m (68.9ft) and drop the trap-room to 4m (13.1ft) below a newly laid flat stage, removing the original rake. The biggest challenge and risk came with Cameron's desire to widen the proscenium arch by 1.5m (4.9ft) and push out the audience boxes nearest the stage to improve sightlines and complement the extra stage depth. This meant detailed coordination to redesign the proscenium opening, create new ornate plasterwork finishes and provide structural fixings for show equipment. A modern safety curtain was installed to fit the wider opening; no drencher system is needed, thus removing the possibility of accidental discharge of thousands of liters of water.

## New timetable

The designs were already well underway when another challenge for the team became apparent. In late August 2015 *Hamilton* took Broadway by storm and Cameron, knowing that the 1,550-seat Victoria Palace would be the perfect West End home for the show, asked the team to find a way

Main: **The refurbished Victoria Palace Theatre reopened in late 2017**
Right: **New equipment was installed in a visually unobtrusive way**


Philip Vile

Above: **The Grand Circle and dome from front of stage**
Below: **The Royal Circle lighting bar**
Bottom: **A communications and sound box facility panel**

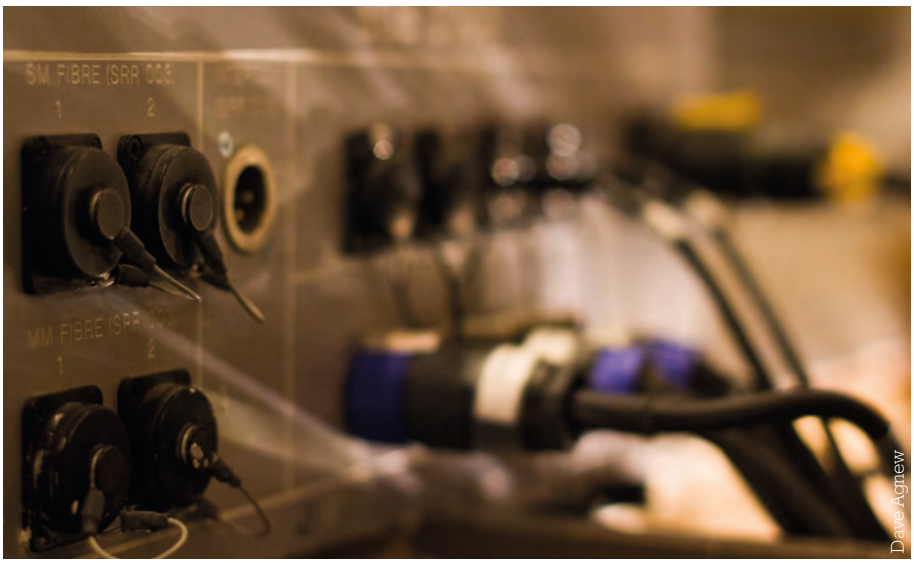
to minimize the closed period so that the theater could reopen with *Hamilton* late in 2017. As the show doesn't need extra stage depth and has minimal flying, the existing fly galleries and grid could be retained and the new upstage wall and grid built around and above it, but the pressure was still on to widen the proscenium.

"We devised an innovative solution introducing *in situ* steel members that were bolted together and to the original proscenium beam, enabling its bearings to be removed to enlarge the opening," says Chris Boydell, project director at Conisbee.

When *Hamilton* closes, the back wall will be knocked through, the existing grid and galleries will be removed and a new counterweight system will be installed.

All this presented Theatre Projects with a number of challenges to coordinate new systems with the existing installation and limit the number of facilities that had to be stripped out and reinstalled in the next phase of work. Primary among these was the safety curtain, which was designed with installers Tait to allow the winch equipment to be relocated to a new, higher grid and the guides extended upward. Similarly lighting and sound facility panels on the stage galleries were terminated in panels that will allow them to be extended out to new outlets in the future.


Dave Agnew



Dave Agnew

## Wired for sound

The sound system design does not include loudspeakers, as each West End show has its own sound design, but a mixture of installed and temporary cable routes were designed and the installers used a variety of cable types, including flat loudspeaker wires chased into the wall finishes and plastered and painted over. Temporary routes use a continuous hollow cornice to hold the cables.

Some installed loudspeaker positions designed specifically for *Hamilton* included delay and surround positions to the rear of the stalls and the circles. These loudspeakers are lightweight, but given that the ceilings in these areas were not originally installed to take this kind of equipment, Conisbee designed connections back to structure to take the loads. "We are particularly pleased with the way the equipment is integrated into the auditorium design, with only short cable runs to the lights and loudspeakers being visible," says Riddell.

## Invisible support

Middleton believes the success of the refurbishment is that "audiences see only a gloriously restored theater and are blissfully unaware of the extensive remodeling, structural services and performance infrastructure work that underpins the reimagined venue".

Working with interior designer Clare Ferraby, Cameron's theater makeover is not simply a restoration but a respectful and sensitive contemporary upgrade with bespoke wall and floor finishes and painted details to the extensive array of ornate plasterwork. Meanwhile, lighting designer Pritchard Themis employed a range of LED lights including specially commissioned chandeliers and wall mounted fittings to bring the interior design to life.

"Not only does the theater look good now, but we are leaving it in good shape for the next production," says Riddell. However, with *Hamilton* proving so popular with UK audiences, it looks as if that won't be any time soon. ■

**www.theatreprojects.com**


THEATRE PROJECTS
theatreprojects.com
Victoria Palace Theatre
with *Hamilton* on stage
Intimacy
Flexibility
Simplicity
Photo: Philip Vile

# Signature sound

Found spaces can offer excellent acoustics in the right hands, but care must be taken to preserve the venue's character

The performing arts world is currently debating and re-evaluating whether more standard auditoria should be built. Most cities now seem to have a 'white cube' art gallery, a proscenium or thrust type theater; and if they have an opera house, more often than not it will be an interpretation of the Italian horseshoe form. As for new concert halls, the question of form has been reduced down to a choice between shoebox and vineyard. For many artists, particularly in the younger generation, typical auditoria have become uninteresting, and they are looking for novel spaces to stage their performances: the possibilities and freedom of artistic expression offered by these 'found spaces' provide a much more enticing alternative.

## Found spaces

Everything from a church to a warehouse, from a multistory car parking structure to a street corner can be called a found space. Each will lend its unique character, both visual and acoustical, to the performance. Sometimes the raw acoustics of a space do not fit entirely with the envisaged use; nevertheless, the quality strived for by artists and musicians is typically just as high as in purpose-built venues.

Kahle Acoustics has been asked to help optimize the acoustics of several found spaces, for one-off events, festivals and for permanent use as a music venue.

The key to working with found spaces is first to understand the inherent acoustical nature of the space, teasing out what is good (there are always good aspects) for the envisaged performance, finding ways to inspire the performers to use the most beneficial aspects

KFB Polska

of the acoustics, and learning how to subtly adjust the acoustics to solve problematic features. This last point becomes particularly important in protected buildings where the building fabric cannot be disturbed. With careful placement of acoustical elements, it is possible to achieve quite astonishing changes with very subtle interventions.

## Preserving the uniqueness

The Musikinsel (Island of Music) in Rheinau, Switzerland, is a former Benedictine monastery located in a meander of the river Rhine. Kahle Acoustics advised on the conversion of the monastery complex into a music school and rehearsal venue. Because the building is protected, it was critical to establish the optimum locations for acoustical interventions in each space, and to primarily work with acoustically active furniture.

Working with the artist Beat Zoderer and architects Bembé Dellinger, custom fabrics were developed for the acoustic panels, which drew inspiration from the building and its history. Some of the acoustic panels are mobile and on wheels, while in other areas, by ensuring sufficient distinction from the historic architecture, panels could be fixed directly to the walls.

## Divine intervention

The Benedictine Basilica in Vézelay, France, which was completed in 1104 and added to the UNESCO World Heritage Sites list in 1979, provides a venue for music performance throughout the year, culminating in an annual summer chamber music and choral festival. While the cathedral-like sound of the basilica is beautiful for historical choral works, for more contemporary choral music and instrumental performances, it suffers from the typical problems of a large church. Poor projection of the sound to the audience and a lack of acoustical clarity result in unsatisfactory involvement and engagement for the audience. Kahle Acoustics' challenge was to greatly improve the music acoustics for the summer festival without touching the fabric of the building.

**Acoustic panels in the Musikinsel Rheinau, Switzerland. The embroidered fabric covering the acoustic panels was designed by the artist Beat Zoderer. Additional sound absorption is provided by translucent curtains developed by the textile designer Annette Douglas. Also visible are mobile acoustic panels, which can be placed where needed to optimize sound**

Kahle Acoustics

Above: **Mock-up testing of mobile reflector panels in the Basilica of Vézelay, France. In this arrangement, the panels are used to enhance sound projection from the stage to the audience**
Below: **The Chapelle Corneille auditorium, with the mirrored side of the chandelier facing downward. It is rotated for performances so that the acoustical reflector and stage lighting face downward**

By listening carefully to the natural character of the basilica, acoustical improvements could be achieved for chamber music ensembles and choral groups. The musicians and audience were moved within the space to take advantage of existing positive features of the acoustics. Following this, a number of floor-standing solutions were developed to enhance musical clarity and projection. By adding relatively small areas of sound-absorbing fabric, primarily behind the musicians, the clarity-reducing reverberation of the Gothic transept and side aisles were calmed. Additional reflector panels enabled the sound to be steered from the musicians to the audience.

The improvements to the acoustics, demonstrated with mock-ups and listening tests carried out over three days of rehearsals in August 2017, convinced the festival organizers to invest in properly fabricated mobile reflectors and absorbers for future years.

## Baroque beauty

The Chapelle Corneille in Rouen, France, a 17th century Baroque chapel protected as a historic monument under French law since 1910, had been used occasionally for classical music and its acoustics had developed a good reputation.

Based on this, the region of Normandy decided to reinforce the chapel's role in the cultural life of the area by formally designating the chapel as a concert venue. King Kong architects and Kahle Acoustics were asked to renovate and transform the chapel, with the crucial limitation that no visible fixed connections to the architecture were allowed.

Key to the success of the project was once again to understand the inherent positive acoustical traits of the space. Listening tests indicated that a central stage, surrounded on all sides by the audience, would provide the best balance of acoustics and rapport between musicians and audience.

The focal point of the transformation is the chandelier: a rotating sphere suspended above

Eric Peltier

the stage and anchored to new roof structure through an existing hole in the stone ceiling. In one orientation, the chandelier provides stage lighting and an optimized sound reflector to spread sound to all musicians on stage, as well as to the entire audience. In the other orientation, a mirrored surface provides a unique perspective on the historic chapel.

In addition to the chandelier, custom reflectors integrated into the last rows of seats hold the sound within the audience area, while custom rolling absorption banners soak up excess reverberation where it is not desired. The acoustic intervention proved successful: not only is musical clarity and engagement excellent, but by adjusting the settings of the acoustic furniture, the acoustics can be tuned to different ensemble sizes and musical repertoire.

## Sensitively done

In all these projects, through careful listening and observation, the positive aspects of the acoustics have been retained, and regardless of the setting of the acoustical furniture, the historic nature and strong character of the spaces, both from an architectural and an acoustical perspective, are present and alive. These projects demonstrate how found spaces can exceed expectations: excellent acoustics can be achieved while preserving the uniqueness of the space. ■

KFB Polska

Above: **To respect the protected architecture of Musikinsel Rheinau, acoustics have been improved through the use of carpet, curtains and radiator cladding, in addition to mobile and fixed panels**

**www.kahle.be**

# Support structure

A world-famous arts festival has transformed how it plans its program and staff using a real-time software tool

The Festival d'Aix-en-Provence was founded in 1949 in the South of France, where it ushered in a new era of creativity. In the early days, Aix was a modest gathering, centered around a unique place where a hand-crafted stage had been erected – the Palais de l'Archevêché courtyard. As years passed, Aix grew into an internationally renowned music festival, devoted mainly to opera, but also offering orchestral, chamber, vocal and solo instrumental concerts, workshops and cross-disciplinary performances. The program for 2018 includes more than 30 performances.

However close to its origins the festival's spirit remains, both its size and technical challenges have increased over the years. Aix expanded to other places inside and outside the city. What the public sees – five main stages in Aix-en-Provence, and a handful of secondary performance places, such as streets – is only a part of the total portfolio of venues that must be managed.

The festival has also become a springboard for creation, with dedicated production teams and costumes and set construction workshops. These workshops are run by 12 permanent staff and host 300 people throughout the year.

## Complex staffing

Overall, Aix's staff numbers vary greatly between low and high seasons, meaning there are a large number of casual workers, and contract management is complex. Planning an event of this size is a major undertaking, whether programming productions, planning activities, building team rosters, organizing space bookings or allocating resources. Information is vital to the planning team's activities, and must be fresh, accurate, and available for circulation when needed.

"In the field of performing arts, planning activities for hundreds of people is a real puzzle without a centralized tool," says Josep Folch, Festival d'Aix-en-Provence's technical director. "The activity schedule changes constantly, and with it, all related resources, be they artistic, technical or material. Incoherent venue reservations and overlapping must be avoided. Besides, the teams or artists should be spared from the additional stress that might occur from confusing schedules, last-minute shifts or convocations to rehearsals."

Problem-free staff scheduling is key: correct timesheets lead to correct payroll operations. "All departments and management layers are affected when anyone must re-enter information and reallocate resources," explains Folch.

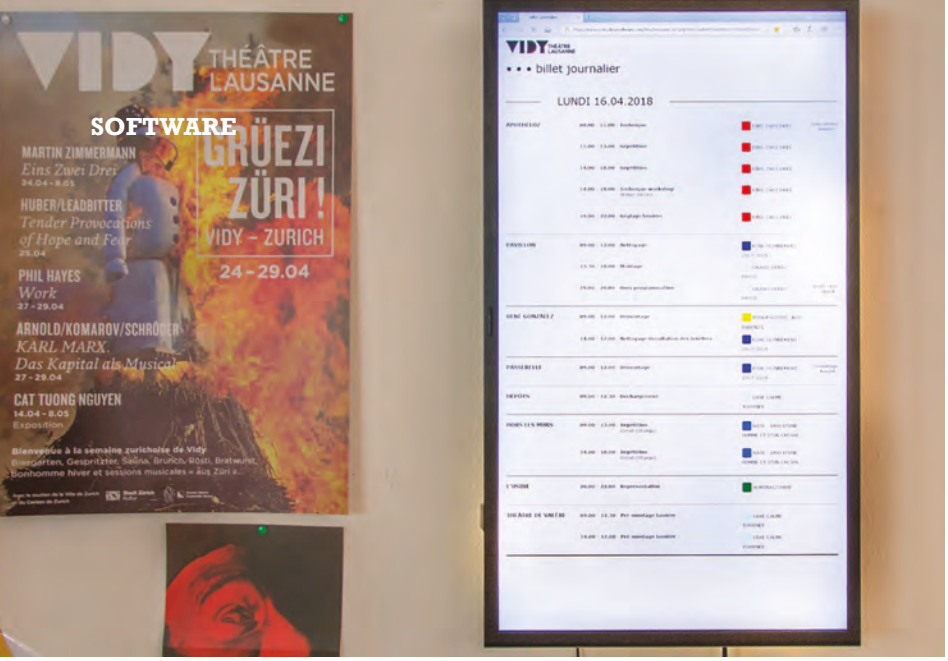
## Third time lucky

Agathe Grimaldi, Aix's chief financial officer, explains that finding a reliable tool was not easy. "After two failed attempts, we found ourselves in a problematic situation as the 2016 festival approached," says Grimaldi. "We had been working with IT4Culture since 2012; they were managing our contacts base. Two years ago, it came to our attention that they had developed several modules such as planning and staff scheduling, which were very relevant to us. #Diese – the name of the software – was already in place at the Paris National Opera."

The Palais de l'Archevêché in Aix-en-Provence

"In the field of performing arts, planning activities for hundreds of people is a real puzzle without a centralized tool"

**Josep Folch, technical director, Festival d'Aix-en-Provence**




Above: **A daily production schedule is displayed in the office at Théâtre Vidy-Lausanne. The dynamic document can be viewed in the software or exported**
Below: **Costume supervisors at a meeting organized by Réunion des Opéras de France**

IT4Culture worked with Aix for several months before implementation as consultants, to analyze its needs in depth. Together with Folch, the French company met with every team: lights, sound, stage management, HR, production, etc. The aim was to create tailor-made responses within the software. "They have been preparing teams for the implementation of a truly shared tool – a way of doing things which is not always self-evident in our sector," Grimaldi adds.

### Designed around the client

#Diese's strength lies in its customizability. The software configuration and the structure of the data are designed around the client's vision, vocabulary, concepts, workflows and rules. The data is displayed in the form wished by the client, with the freshest data.

In 2017, Aix managed all its general planning with #Diese software– including artistic and non-artistic activities, for all types of events. Staff scheduling was also handled in the software, with teams alerted to activities and tasks, and a direct link to payroll. Every morning, 300 people were automatically sent their schedule for the day through a dynamic link generated by #Diese. Contracts were created, edited, managed and stored within the dedicated module. #Diese also hosted budget management, with financial forecasts established in connection with the different modules.

### Information sharing

All this was created to respond to a common sentiment from customers: a shared tool is a must to help improve processes and ways of working together.

The 2017 edition of Aix was an undoubted success, with more than 80,000 spectators coming to enjoy great pieces such as Pinocchio or Carmen and discovering the Aix Académie's promising young talents.

IT4Culture is proud to partner with such inspiring projects, providing a software platform tailored for the performing arts sector. It is now used in 10 European countries, by organizations that are as diverse in size as in artistic domains: from classical music ensembles to theaters, museums and parks. ■

**www.diesesoftware.com**

## COSTUME DRAMA

Some of the greatest European opera houses and theaters have chosen #Diese to manage their costume inventory, for which there is a dedicated module. The Royal Opera House in London, UK, the Dutch National Opera in Amsterdam, the Netherlands, the Staatstheater Stuttgart in Germany, and the Paris National Opera in France chose #Diese to help face similar challenges.

Imagine a stock of more than 7,000 costumes, which may have been lent or borrowed, are being worked on or repaired. The costumes are constantly taken from stock to productions, from stages to workshops, and from one storage facility to another.

There are various elements to each costume, a dress, shoes and a hat for example, and many sub-elements, such as buttons, fabric or brooches. This means a stock of 7,000 costumes may actually entail 30,000 elements.

Costume supervisors have to know where everything is and ensure that costumes are adjusted to each actor's measurements. For new performances, there may be last-minute adjustments to cater for new inspirations or unexpected performers.

With #Diese, every costume can be linked to a role and a specific scene if needed. Data is entered once, and then every element is stored with information such as location, condition, maintenance instructions, color, size and supplier. Artists' measurements can be stored – with conversions and export tools – to save costume makers' time.

The Inventory module also allows users to manage stock such as lights, props or sound equipment, with customized data structures and export options.

# #DIESE

## Manage your venues, activities & resources with a cloud software dedicated to performing arts


OPÉRA NATIONAL DE PARIS · die staats theater stuttgart · THEATRES DE LA VILLE DE LUXEMBOURG · GRAND THÉÂTRE GENÈVE · FESTIVAL D'AIX EN PROVENCE · ROYAL OPERA HOUSE · VIDY THÉÂTRE LAUSANNE · DUTCH NATIONAL OPERA & BALLET · THEATRE DES CHAMPS-ELYSEES

+339 52 78 32 50 diesesoftware.com contact@it4culture.com

# Sound advice

Technology can help venues to expand their audiences and optimize the customer experience – but strategic thinking is required from the outset

For today's venue operators, commercial viability can be tough to achieve. Business models are having to adapt to attract broader audiences, provide a customer experience, focus on customer dwell times, maximize revenue streams, and make strategically relevant investments in new technology solutions.

David Claringbold relishes such challenges. In former roles as executive director at Sydney Opera House and as a venue consultant to the arts and culture sectors, he developed a deep understanding of both the forces that drive decision making and the pitfalls that can befall the unwary. Now, as chief marketing officer of audio technology solutions company d&b audiotechnik, he is keen to share his insights into venue management and the role that technological solutions can play in a successful venue strategy.

## All things to all people

To begin with, Claringbold points to perhaps the biggest pitfall facing venue operators today. "My fear is that we're beginning to feel the need to design our venues to do everything, and that brings the danger of a crisis of identity," he comments. "I would encourage people to be very clear about their strategy, the identity of their venue and what exactly they are trying to achieve. Otherwise we will build sheds with great parking areas, and I don't want that to be the future of venues."

According to Claringbold, the pressure to attract multiple audiences and develop revenue streams is real, but strategy must rule. Once a venue has defined the scope of what it wants to be, it can begin to develop its programming to widen its audience. Changes here can involve place as well as content. Many successful venues, including Sydney Opera House, use exterior spaces, for example. "Taking the work out of its usual context can actually make it more approachable for people," says Claringbold. "Many may feel they don't belong in an opera house, and this is a challenge. How do you get people to cross the threshold and have them feel that your venue is for them?"

## Customer experience

For this reason, attitudes to customer experience are evolving alongside programming. "A lot of venues are remodeling to develop the 'secondary economy'," says Claringbold. "They were always designed to sell tickets and put on shows, but the customer experience wasn't really considered. Now we're seeing a move to a much more integrated model."

In many leading venues the trend is toward enriching the visitor experience. Claringbold uses the example of stadiums where visitors can pre-order food or merchandise, access behind-the-scenes information via high-density wi-fi and be immersed in entertainment from the moment they arrive. "This opens up a much richer engagement," he says. "It's all powered by sophisticated technology backbones."

“My fear is that we’re beginning to feel the need to design our venues to do everything, and that brings the danger of a crisis of identity”

**David Claringbold, chief marketing officer, d&b audiotechnik**

Photos: CKK Jordanki

## THE JORDANKI CULTURAL & CONGRESS CENTER

The Old Town in the Polish city of Toruń is a medieval jewel of architecture, yet at its very heart, the Jordanki Cultural & Congress Center (CKK) is boldly modernist. The work of Spanish architect Fernando Menis, CKK provides a multipurpose cultural hub for the city and its surrounding area, with two concert halls, a cinema, conference rooms, rehearsal spaces, a restaurant and more.

Piotr Jankiewicz, director of the design and integration department at Konsbud Audio, was the project director. "This project was a huge challenge for us, partly because the building's shape and purpose required a very sympathetic approach to the installation," he says. "It was crucial to have a very versatile system, hence we chose d&b loudspeakers, which deliver both in terms of frequency response and sound pressure level.

"The d&b T-Series loudspeakers are ideal for the Chamber Hall because they can be used both as a line array and as a high directivity point source loudspeaker," he continues. "They can be used not only as front-of-house sound reinforcement loudspeakers, but also in other situations where there is a need to provide sound reinforcement in other parts of the stage or other rooms."

Above: **T-Series loudspeakers from d&b were chosen to provide flexible audio in the Jordanki Cultural & Congress Center in Torún, Poland**

Technology has much to offer in this changing paradigm, but again, strategy is king. "You need to ensure that your venue technology capability is aligned with your artistic strategy and your vision for what the customer experience should be," says Claringbold.

A high-quality, adaptable sound reinforcement package, for example, is a considerable investment for any venue. Claringbold encourages operators to carefully consider a number of factors when making such investment decisions.

"You have to think carefully about the design of every element, from the outset," he says. "Often, people will design audio as an afterthought, and find they can't get the loudspeakers into the positions they really need without clashing with the lighting or rigging requirements. It's about getting that briefing right, up-front. Who are we as a business? What are we trying to achieve? And then elevating all aspects of the technology framework to allow the venue to achieve its vision."

### Fit the program

Then there are specific factors to be aware of when choosing an audio system. "You have to ensure that you can align your sound system design with your venue's programming matrix," says Claringbold. "Also important is economy of operation: making sure the system is designed in such a way that it minimizes the number of people required to deploy it and operate it to the required standard.

"Venues also need to look for a system that won't become outdated in a couple of years. It needs to be provided by a partner that has an established track record of bringing to market new products that remain compatible with their existing technologies. Then, of course, you look for commercial acceptance: you need to be sure that you won't have to keep changing it over to suit certain users, or keep making excuses for the system."

Generally, Claringbold believes awareness of the opportunities presented by audio is improving. "We're seeing a great awareness among those who have an aspiration to take their venues to a high-level experience – they increasingly appreciate the value of audio in helping them achieve that," he says. "People are moving beyond seeing audio as being purely functional; they're looking at it now as being part of their brand." ■

**www.dbaudio.com**

# More art. Less noise.

**dbaudio.com/moreart-lessnoise**

d&b audiotechnik

# Game changer

For venues such as the Kilden Concert Hall in Kristiansand and the RMCC in Wiesbaden, custom retractable seating solutions were the key to flexibility

Designing retractable seating for concert halls is a challenging task. The seats must meet the comfort levels expected of a fixed auditorium seat, the mounting and retractable structure should feel fixed, and when people walk on the structure or move in the seat, the noise generated should be similar to a fixed installation.

Waagner-Biro has designed and manufactured solutions that met these requirements in concert halls for Kristiansand and Stavanger in Norway, and the Elbphilharmonie in Hamburg, Germany. Frequently the requirement is for curved seating, as in the Kristiansand project.

## Full tilt

Waagner-Biro's flat-floor solutions are not limited to retractable seating. The company has developed solutions based on tilting auditorium floors. One option for these installations is to integrate the seats into the platforms. The seats can be deployed manually or can be fully automated, so they fold down beneath the floor, leaving a flat surface.

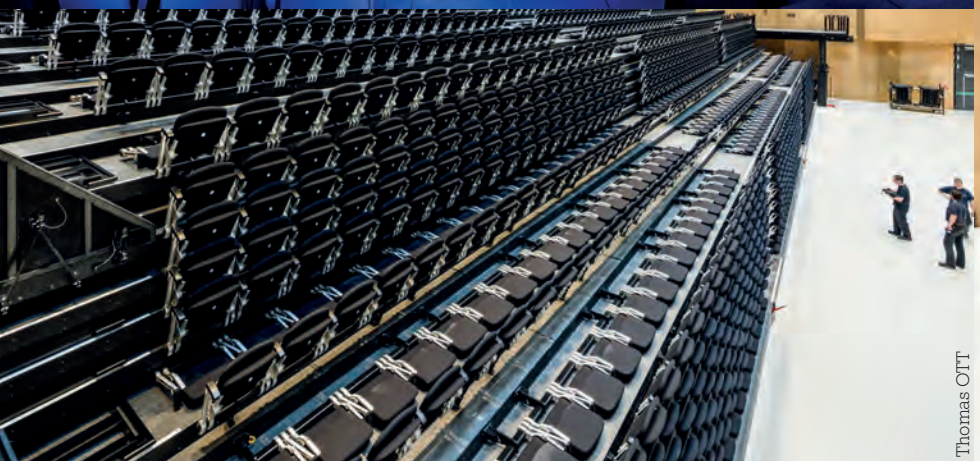
The Matrex Business Centre in Moscow, Russia, takes the form of a Russian matryoshka doll. It has a circular floor and 11 platforms of seating with integrated ventilation. The circular platforms have an outermost diameter of 19.8m (65ft) and can be raised 4.5m (14.7ft) above the floor, enabling 540 seats to be deployed in various curved configurations.

Waagner-Biro has also developed auditorium seating that transitions automatically from a flat floor to an inclined row. The system consists of tiltable main beams that are pivoted, with a system of levers ensuring that the seats remain in a horizontal position. The geometry of the rows can be straight, rounded or segmented. Some examples of flexible auditorium seating integrated into platforms include the Ronacher Theatre, Vienna, Austria, and also the Giant Amber Concert Hall in Liepaja, Latvia.

## RMCC installation

On April 13, 2018, the RheinMain CongressCenter (RMCC) in Wiesbaden, Germany, opened with a seating system and stage machinery provided by Waagner-Biro. As flexibility was key, the concepts developed for this venue provide a range of configurations with flexible seating, walls and floors. The unique architecture and the flexible space concept

**Main and inset:** A curved retractable seating system created for the Kilden Concert Hall in Kristiansand, Norway

Thomas OTT

Thomas OTT

Top left: **The Matrex Business Centre in Moscow, Russia**
Above and right: **The versatile seating system provided for the RheinMain CongressCenter**

provide the perfect conditions for events with up to 12,500 people.

The RMCC consists of two function halls separated by a common foyer – the 4,600m² (49,500ft²) North Hall and the 2,900m² (31,200ft²) South Hall. The North Hall has an automated telescopic seating system that is 39m (128ft) wide in total. It has three sections and deploys 2,924 seats over a distance of 48m (157.5ft). The height of the seating blocks is 8m (26.2ft) and when retracted the depth is 3.6m (11.8ft). The step riser is 16cm (6.3in) high and the seats are fully upholstered.

When not in use, the seating blocks are automatically driven into the storage area, and the timber-veneered doors close behind them.

When deployed, the structure incorporates handrails, step lights and architectural cladding.

## Emergency preparedness

Waagner-Biro was also involved in the emergency evacuation design and delivered demountable pedestals to facilitate evacuation when the seating is deployed. When these are deployed, visitors have easy access to escape doors on the first level on both sides.

The pedestals have been developed to be easily dismantled for storage and can bear loads of 750kg/m² (150 lb/ft²). As a special feature, the pedestals can also be used with retracted seating (additional railings are provided). Visitors can easily move between conference rooms and trade fairs on Level 0.

The seating can also be partially deployed, for example for concerts. In this configuration with 2,200 seats, the last eight rows stay retracted. To guarantee the integrity of the emergency exit at the rear, a special staircase is installed as an alternative ascent.

Both the retractable seating and the stage machinery are fully integrated with the Waagner-Biro CAT control system.

## Green award

The new congress center has already received a platinum award from the DGNB (German sustainable building council). To play its part in reaching this achievement, Waagner-Biro had to ensure it met all the requirements of a green building, including the use of sustainable materials and processes.

Nowadays clients demand greater flexibility from a venue. Waagner-Biro transforms venues using designs and methods developed over decades to maximize use and revenue opportunities for venue operators. ■

**www.waagner-biro.com**

# —STATE-OF-THE-ART FLEXIBLE SEATING FOR RMCC WIESBADEN—

RheinMain CongressCenter Wiesbaden / © Thomas Ott

waagner biro

WWW.WAAGNER-BIRO.COM

ABU DHABI*BAKU*BARNSLEY*DOHA*DUBAI*JAKARTA*LONDON*LUXEMBOURG*MADRID*MANILA*
MOSCOW*SHANGHAI*ST. PETERSBURG*VIENNA*WARSAW*WEIHERHAMMER*

# Moscow makeover

Moscow's rejuvenated Zaryadye area includes a new concert hall with an ingenious solution for multifunctionality

Within Kitai-gorod and bordered by the Central Squares of Moscow lies a district with a storybook-sounding name, Zaryadye, or 'the place behind the rows' – referring to the market rows adjacent to Moscow's famed Red Square. It is here that the first new Russian public park in 50 years has been created, complete with a concert hall featuring Serapid's new QSX seating system.

It was once a vibrant trading area populated by the wealthy, but a series of ill-fated events shaped its reputation as the least desirable neighborhood in Moscow: a poorly planned wall that led to sewage issues, the Fire of Moscow in 1812, the rise of cheap tenement housing for factory workers, and a series of pogroms, all of which led to the inevitable and progressive demolition of the neighborhood, starting in 1936 and continuing into the early 1960s. This was followed by the construction of the massive Hotel Rossiya, a 21-story, 5-star hotel, that was almost a city within itself, including a police station with jail cells and a 2,500-seat concert hall. By the 1990s, the hotel fell into disrepair and was eventually demolished in 2006. The area was first slated for luxury apartments, but those plans fell through, leaving 10.2ha (35 acres) of valuable open space with no plans for use.

## Wild urbanism

The current architectural conversation about revitalizing iconic cities concerns the intersection of preservation, arts and culture, sustainability and new technology. By the time city officials announced an international design competition for developing Zaryadye in early 2013, they had already been in contact with city development company Citymakers, which had campaigned for the area to be turned into a public park similar to the High Line project in New York. The winning proposal, a stunningly ambitious plan by a design consortium led by the designers of the High Line, Diller Scofidio + Renfro (DS+R), hit all the marks in this discussion.

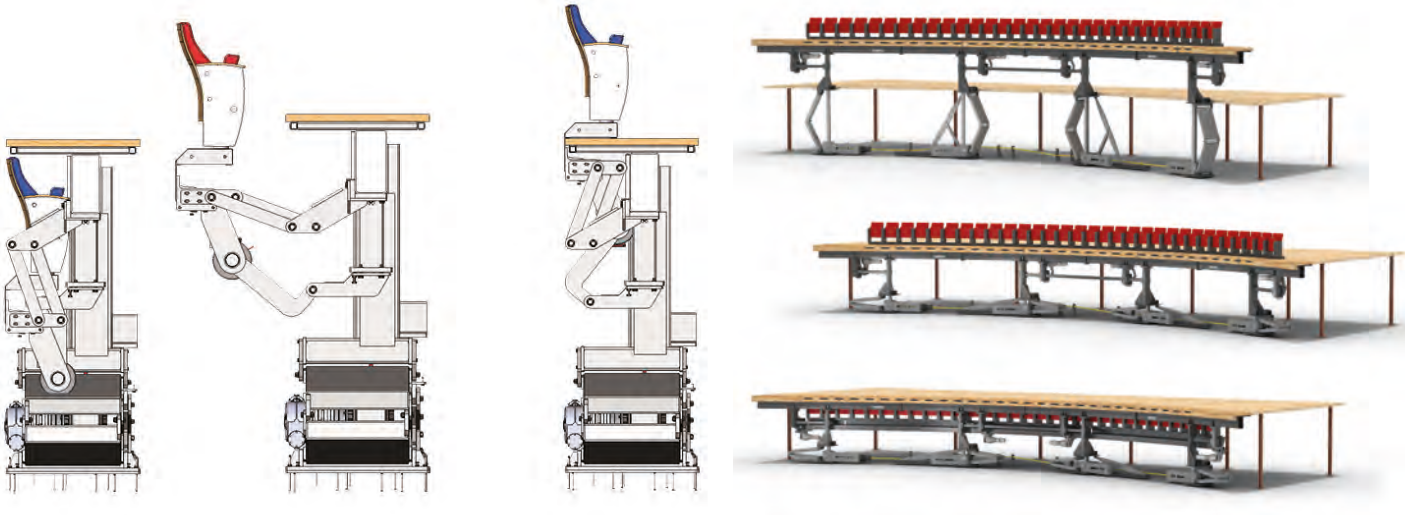
To please the preservationists, the open design of the park offers spectacular views of the nearby cultural heritage monuments, further enabled by a boomerang-shaped overlook above the Moscow River. As a sweeping statement on natural biosystems, the park area is divided into four zones representing the natural features of Russia: wetland, forest, steppe and tundra, sustained with both active and passive climate assistance. Barrier and fence-free, the sloped landscape has a natural and untamed feel, something DS+R calls 'wild urbanism'. Since the demolition of the old hotel had left the community without a concert hall or performance space, the plan included a 400-seat theater, an amphitheater, and a multifunctional concert hall featuring a technologically advanced transformable room system, the Serapid QSX.

## Multifunctional hall

The 1,560-seat Philharmonic Concert Hall needed to be completely multifunctional, with an automated system that enabled a quick change from flat floor to raked seating. The funnel-shaped room would have 20 curved rows ranging from 29 to 42 seats per row, in addition to three more areas calling for lifting systems: the backstage, the choral area and the orchestra area.

The chosen integrator, Doka, has had a close working 15-year relationship with

**An automated system enables the Zaryadye Concert Hall to quickly change from flat floor to raked seating**



Above left: **The QSX seat motion and** (right) **the system deployed**
Below: **A 3D drawing of the Zaryadye Concert Hall seating system**

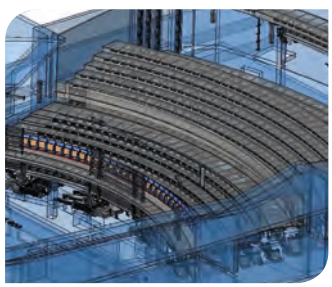
Serapid, so knows its capabilities very well, making Serapid the obvious choice of partner for the delivery of this project.

## Clever configuration

Serapid's first seating transformation system had been installed in the auditorium at the beautiful Fondation Louis Vuitton in Paris, France, in 2014. The system, comprising 16 straight rows with adjustable rake, has proved simple and reliable to use. Following this project, Serapid had been developing a new version that would handle both curved and straight rows of seating.

"The curved row configuration enables all the audience to have the same angle of view as well as the same acoustic conditions," explains Thomas Loeuil, project manager at Serapid.

"The concept of the new QSX system was introduced worldwide in 2014. We then created a prototype in our workshops in France that served as a model for the development of the Zaryadye project. This enabled the Serapid and Doka engineers to work together in an extremely efficient collaboration from the start of the project, with no possibilities of misunderstandings about the technical performance of the QSX system."



In use, the system starts with the seats stored underneath the floor, and through a circular translation movement, they are moved into position. A wide variety of configurations are possible – the rake can vary from 0-5m (0-16ft). The system is guided by lambda scissors for longitudinal stabilization and wallet scissors for forward and back stabilization. The drive system has a lateral motorized pantograph and a central motorized arm, and the lift motion is provided by LinkLift80 columns. The Zaryadye Concert Hall can be fully reconfigured within 30 minutes.

The concert hall is considered one of the most complex projects in the park, and was the last facility to open, in March 2018. Reflecting on the relationship with Doka, Loeuil notes, "The opening of the Philharmonic will represent the end of three years of close and effective collaboration between our companies." ■

**www.serapid.com**

## KEY FACTS

- **Client:** City of Moscow, chief architect Sergei Kuznetsov
- **Site:** 10.2ha/35 acres
- **Consortium lead/concept designer:** Diller Scofidio + Renfro
- **Landscape design and masterplan collaboration:** Hargreaves Associates
- **Local partner, urban designer:** Citymakers
- **Engineering consultant:** Buro Happold
- **Lighting:** Arup
- **Contractor:** Mosinzhproekt
- **Integrator:** Doka Group

**Serapid supplied:**

- QSX 20 rows area
- Full design of the rows
- QSX transformation system
- Linklift lifting systems
- Automatic barrier with linear beam

**The QSX installation:**

- In terms of accuracy, the system achieves a gap of 6-7mm (0.2-0.3in) between rows
- The configuration is raked from 0-5m (0-16ft)
- There are 20 rows and 677 seats
- The row length is up to 30m (98ft), installed in a curved shape with a 19-39m (62-128ft) radius
- The venue can be transformed in 30 minutes

SERAPID
RIGID CHAIN TECHNOLOGY

# THE ART OF MOTION

## Solutions for Theatre

**INNOVATIVE PRODUCTS FOR STAGE LIFTS AND VENUE TRANSFORMATION**

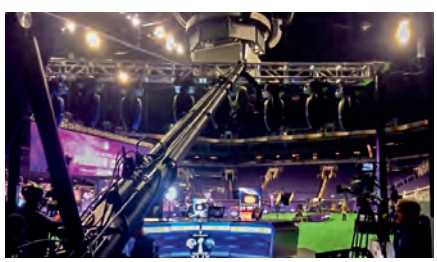
**SERAPID lifts,**
**the most robust stage lift systems available.**

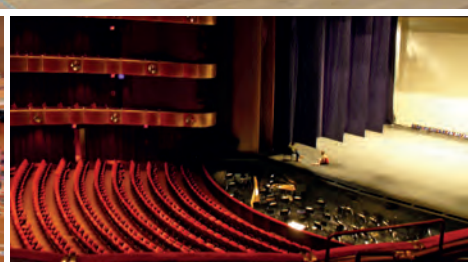
SERAPID stage lifts feature the patented LinkLift column, made with Rigid Chain Technology.
Our systems can be found worldwide in:
- Performing Arts Centres,
- Convention Centres,
- Historical theatres,
- Concert Halls,
- High Schools and Universities,
- Cruise Ships.

**Introducing our newest products:**

The **QSX venue transformation** on system, a fast and fully automated system that transitions from flat floor to variable raked rows of seats for either straight or curved rows.

The **Telescopic Mast**, a fully automated portable lift for lights, cameras and sound equipment, featuring heavy load capacity, precision movement and easy programming.





**STAGE LIFTS | ORCHESTRA LIFTS | AUDITORIUM LIFTS | GET IN AND TRANSPORT LIFTS | FLEXIBLE SEATING SOLUTIONS**

**www.serapid.com**

# Power shift

## Mobile stage technology is moving toward low-carbon economy and wireless operation

One of the greatest challenges of the 21st century is changing from fossil energy to renewable energy. In 2007 the EU adopted ambitious energy and climate objectives for 2020 and after. One goal is to increase the share of renewable energy to 20% by 2020. The Renewable Energy Directive (2009/28/EC) sets rules for the EU to achieve this target. This directive concerns all industrial sectors and thus also the entertainment industry.

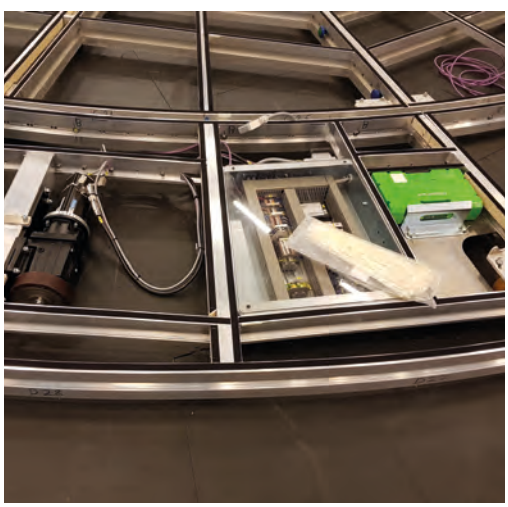
Mobile stage technology without electrical energy is impossible today. But wireless operation of set design for stage or touring productions is still not a common option, even though there is a big advantage in not being dependent on cables. As well as having free access to power wherever you are on stage, there are no visible cables on the stage floor.

### Overcoming battery limitations

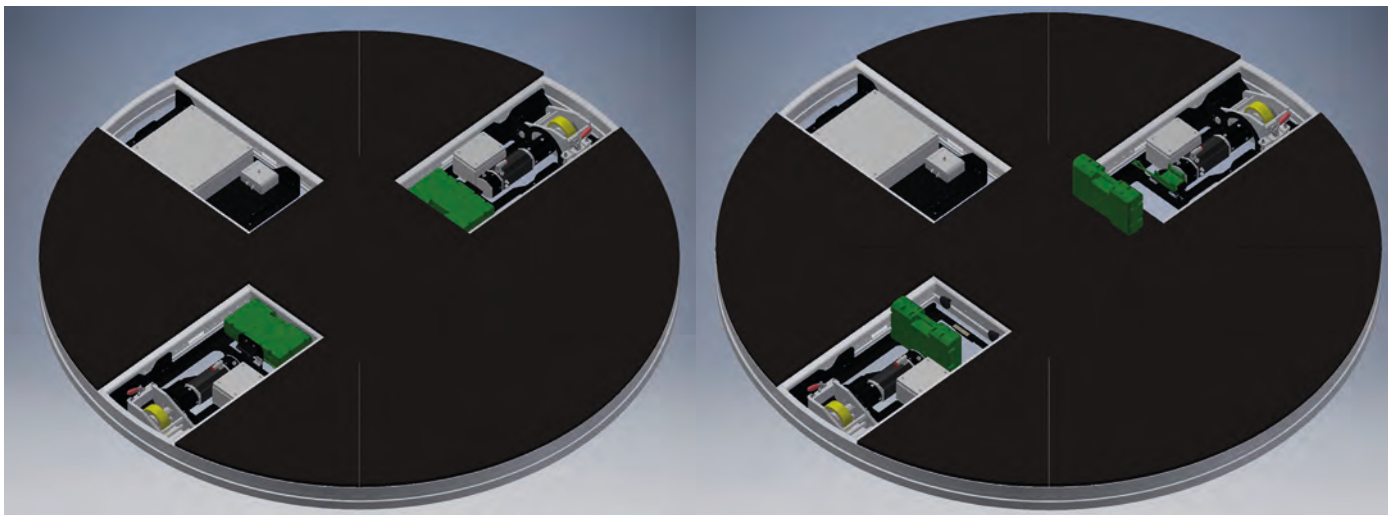
As a well-known company in aluminum constructions for mobile stage technology, Hoac also manufactures electrically driven constructions. Its range of motorized products goes from stage wagons over turntables to track systems, and the idea of having this equipment driven by battery power is not new. But existing systems in the theater market are island solutions that can cause problems in storage, use, maintenance, recharging cycles and handling of defective accumulators.

Two years ago Hoac was looking for an innovative accumulator supplier and discovered a startup in Berlin, Germany, called GreenPack Mobile Energy Solutions. This company creates a mobile energy network using just one open-source battery type. The characteristics of its accumulator are that it is user friendly, standardized, open, portable, ready for multi-use and easy to integrate. However the revolution of this system is the philosophy of creating a mobile energy network and providing on-demand renewable energy for everyone in a theater by running an in-house accumulator station. This station features intelligent data collection, optimizes charging processes, identifies users and provides convenient and easy ready-to-use accumulators. GreenPack offers a sustainable, intelligent system to store green energy for easy transportation and mobility.

The Li-ion cell has a nominal voltage of 48V and a capacity of 1,400Wh. The continuous rated power is 1,200Wh and it can be charged more



Main image: **Installation of the outer circle**
Opposite left: **The first setup on the turntable with a battery-driven outer ring**
Opposite right: **From left to right: a servo motor, a control unit with radio receiver and the accumulator**



Above left: **The turntable operates without external power cables**
Above right: **The accumulators can be removed easily**
Below: **A standard charger case**
Right: **A battery-driven carriage for the Hoac Silent Move flying system**


than 1,000 times. The battery is cluster ready for an even better performance, bigger storage and controllable release. The standardized geometry is 370 x 90 x 320mm (14.5 x 3.5 x 12.6in), with a weight of 9kg (19.8 lb). The charging cycle is fast and easy under controllable conditions.

## Royal Opera House

Hoac first put the solution to use at the Royal Danish Theatre in Copenhagen, Denmark. The task was to provide power, independent of the external supply, to a moving ring as an extension of an existing turntable in the house. This turntable had a diameter of 9.5m (31ft) and the new outer ring, with a width of 1.25m (4ft), extended it to 12m (39ft). The height of the turntable was 200mm (7.9in) including the surface. The ring could carry a total load of 2.5 tons. The whole construction was the main part of a set design for a production that went on tour after the première in the Royal Opera House.

The ring was driven by four 48V DC servo motor modules and did not require any additional supply. All the components required for control were also installed into a frame and mounted in the ring. A radio receiver was integrated into the control module to enable operation with a handheld radio control.

To power the control on the ring, another accumulator was used. In addition, a small operating console was used to switch the system on and off manually as well as to select or deselect the brakes. The position of the ring was determined by an absolute encoder in the control module. The accumulators were able to power a complete rehearsal and a show

with just 25% of their energy. Charging took place after the show in special cases.

The next step was to develop a control unit with a handheld controller as a standard for mobile turntables to ensure easy operation and independence from the power supply wherever the production took place. The technical features are the same, but to save budget it was decided to power the control unit from one of the accumulators intended for one of the servo motors, since this control does not need much voltage. In addition, for convenient use a charger case comes with the system for easy recharging.

## Track applications

Another application Hoac offers is the integration of the GreenPack accumulator in a motorized track system to eliminate trailing cables. The low weight of the accumulator enables smooth movement along the track and invisible operation.

The combination of Hoac's well-known stage technology systems and the GreenPack renewable energy solution will open an innovative field of mobile products on stage, providing on-demand green energy. ■

**www.hoac.com**

HOAC®
stage systems

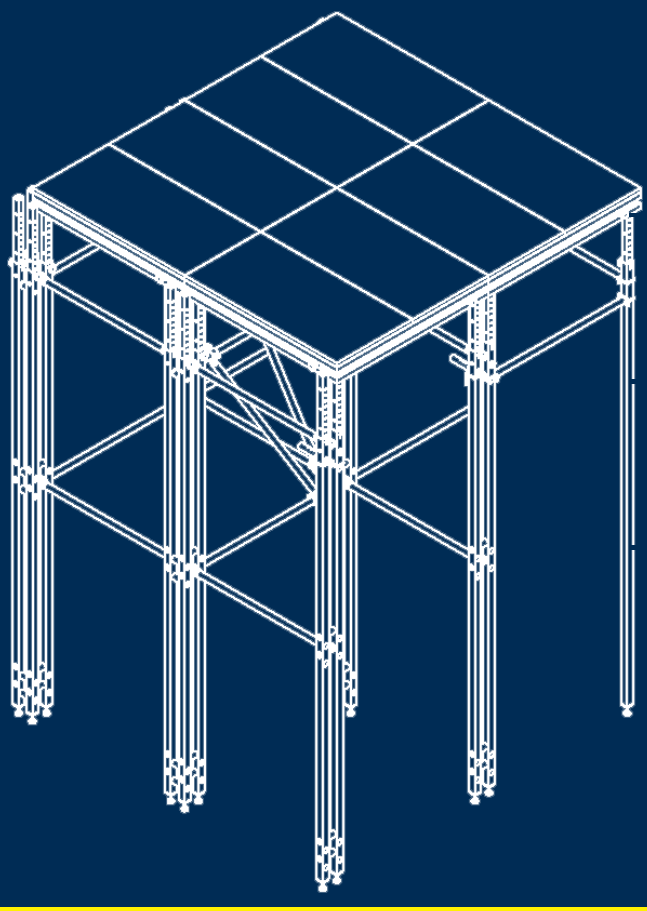
# HOAC® WE MAKE IT HAPPEN!

Discover our manifold product range or ask for your solution. Our detailed knowledge, based on more than 30 years experience to the needs in theatre & stage technology is the power to your success – worldwide.

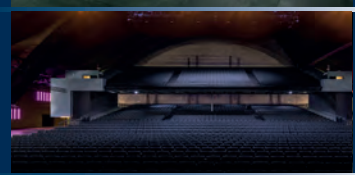
**MEET US AT: Stage | Set | Scenery,** Berlin, Germany, 18. - 20. June 2019
international exhibition and congress for stage technology

**NEW 2018**

## Check our advanced System Frame 4.0!



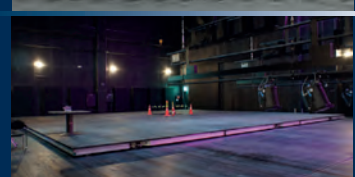
FLEXIBLE STAGES



MOBILE TRIBUNES

TURNTABLES

TRACK SYSTEMS
FLYING SYSTEMS



STAGE WAGONS
CHAIR WAGONS

TRUSSES
LIGHTING BRIDGES

**HOAC®** SCHWEISSTECHNIK GMBH
PFERDSWEIDE 39C | 47441 MOERS | GERMANY
PHONE +49.2841.90828-0 | FAX +49.2841.90828-70
INFO@HOAC.COM | WWW.HOAC.COM


# All set!

The stage technology industry will meet in Berlin, Germany, on June 18-20, 2019, for Stage|Set|Scenery

What are the latest stage technology trends in outstanding new construction and refurbishment projects? What can small theaters and opera houses learn from big international beacon projects in terms of stage technology? What are the trends in building systems, fire and production safety? These are just some of the questions that the third edition of Stage|Set|Scenery will be examining at the Berlin Exhibition Grounds from June 18-20, 2019. The biennial international trade show and conference for theater, film and event technology is organized by Deutsche Theatertechnische Gesellschaft (DTHG) and Messe Berlin, and targets architects, stage planners, stage managers, safety officers, sound and lighting engineers, scenographers, costume makers and make-up artists.

Some 12 months before the international trade show and conference is due to open its doors, demand is high for places at Stage|Set|Scenery. In fact, 70% of available floor space has already been taken, which bodes well for next year's event. Exhibitors from 14 countries, including the UK, France, China and Canada, have already registered their stands. Products and services from every sector required for a successful production will be represented, including stage equipment, drive and control systems, architecture and planning, lighting, sound, decoration and furnishings.

## Stage technology experts

Major machine and systems manufacturers – including Bosch Rexroth, SBS Bühnentechnik and Waagner-Biro Austria Stage Systems – have

secured their places at Stage|Set|Scenery. They design, manufacture and install complete stage technology systems and the relevant control and operating systems, as well as individual modules for well over 100 event venues around the world, including the Burgtheater in Vienna, Austria, the National Theater in Taipei, Taiwan, and the China National Grand Theatre in Beijing. Exhibitors also include the international planning offices of Kunkel Consulting International, Müller-BBM, Skena Planungsgesellschaft and theaterprojekte daberto + kollegenplanungsgesellschaft, which have registered their stands and will be eager to exchange information on international projects.

At the event the focus will again be on an international exchange of views among experts. The two organizers will be collaborating with stage technology associations from the USA, China, Switzerland, Austria and the International Organisation of Scenographers, Theatre Architects and Technicians (OISTAT), among others. The OISTAT Education Commission and Publication Commission will hold its annual conference at the event.

Numerous other national and international key players have confirmed their participation. They include Alfa System, Bühnenbau Wertheim, Bühnenplanung Walter Kottke Ingenieure, ETC-Electronic Theatre Controls, Gala Systems, Gerriets, Hoac, Mayr Antriebstechnik, Räder-Busch, Serapid, Show Theatre Equipment Trekwerk, Tait Stage Technologies, Theatertechnische Systeme, Unican and Zhejiang Dafeng Industry.

## Symposium and workshops

In addition to the display halls, the place to head for trade visitors will be the International Stage Technology Conference, where consultants and architects can find out about current and

Above: **The latest stage technology trends will be on show at Stage | Set | Scenery**
Opposite page: **Exhibitors from 14 countries have already registered for the 2019 event**


Above: **The use of stage technology in multipurpose buildings will be among the topics discussed at the event's roundtables and workshops**

future industry trends at an international symposium, roundtables and workshops. Stage|Set|Scenery will be placing an emphasis on interactive formats with a focus on practical aspects and a wide range of topics. There will be presentations of best practices as well as concrete discussions about practical issues, for instance on the use of stage technology in multipurpose buildings.

The International Stage Technology Conference is organized by DTHG, one of Germany's longest-established professional associations. In 2017 it hosted around 100 presentations at Stage|Set|Scenery. One of the highlights was a panel discussion entitled 'It's all about the process: architects, theater consultants, users – Who manages cultural projects?' Among the prominent figures who took part were Prof. Meinhard von Gerkan, the architect who designed Berlin Hauptbahnhof in Germany; Carlos Ott, the Canadian-Uruguayan architect who designed the Opéra de la Bastille in Paris, France; David Staples from Theatre Projects Consultants; Andy Hayles from Charcoalblue; and Geoff Wheel, technical director of the Dubai Opera, UAE. DTHG is planning an international symposium for 2019 on 'Building and Refurbishing Theatres in the Future'.

### Latest industry trends

Due to the very positive response, the roundtable discussions that were introduced in 2017 on stage technology (Hall 21), sound (Hall 22) and decoration and furnishings (Hall 23) will be taking place again. The events will be centrally located in the halls, ensuring trade visitors and exhibitors need cover only short distances and have a chance to discuss topics and solutions, and meet new people amid all the action.

In 2019 at the SoundLab, which has undergone a major technological expansion, trade visitors can witness live demonstrations by leading companies, including Gerriets, KS Beschallungstechnik, Müller-BBM, Salzbrenner media and Sennheiser. Away from the bustle of the show, visitors can experience the latest audio technology trends in an ideal acoustic environment. In 2019, for the first time at the SoundLab, other companies can also give live demonstrations. Yamaha, a manufacturer of audio systems and music instruments, has already announced its participation.

In 2019, under the slogan 'Brighten the Future', the LightLab will again be curated by the internationally renowned lighting designer Ollie Olma from mo2 design. Lighting manufacturers, designers and technicians will gather to test new products, discuss practical scenarios and exchange views on everyday work situations.

### Safety in Action

The show's strong emphasis on practical aspects will also be reflected by the Safety in Action stage displays in Hall 22 where in 2019, under the heading of 'Up in the air – Working under Suspended Loads', the focus will be on production safety. Simultaneous interpretation means both German and English speakers will be catered for. In 2017 more than one-third of visitors came from abroad.

On 21 June 2019, the day after the show, exhibitors and trade visitors can also take part in several excursions where they can witness event technology solutions being put to the test under live conditions. Last year the program included visits to the Elbphilharmonie in Hamburg and the Barenboim Said Academy in Berlin.

For architects and consultants wishing to make the most of their time at the event, there is now a tool enabling them to plan their visit in detail. The Virtual Market Place, the online directory of participants, enables trade visitors to search for and find products, services and partners for large-scale global theater, opera and concert projects, enabling them to get in touch ahead of the show and make appointments. ■

**www.stage-set-scenery.com**

## KEY FACTS

- **Dates:** June 18-20, 2019. Excursions on June 21, 2019
- **Venue:** Berlin ExpoCenter City, north entrance
- **Key topics:** stage equipment, drive and control systems, architecture and planning, lighting, acoustics, sound, video and media technology, studio technology, events, museum and event technology, decoration and furnishings, make-up, costumes and safety systems
- **Organizers:** Deutsche Theatertechnische Gesellschaft (DTHG) and Messe Berlin

# stage | set | scenery

## WORLD OF ENTERTAINMENT TECHNOLOGY

**INTERNATIONAL TRADE SHOW AND CONFERENCE**
**BERLIN · 18 – 20 JUNE 2019**


der fachverband DTHG Deutsche Theatertechnische Gesellschaft

Berlin Exhibition Grounds · www.stage-set-scenery.com

Messe Berlin

# Challenge accepted

Two recent UK projects – Lincoln's Inn's Great Hall and the Sainsbury Theatre at LAMDA – presented challenges that prompted Steeldeck to come up with ingenious stage solutions

One of the things Steeldeck is most proud of is its ability to provide bespoke staging solutions that solve issues – some that are known from the outset and some that only become apparent once a project is underway. The company has recently undertaken two such projects in London, UK – the Great Hall at Lincoln's Inn and the Sainsbury Theatre at the London Academy of Music and Dramatic Art (LAMDA). Both projects required ingenuity and invention.

The Great Hall at Lincoln's Inn, one of the four Inns of Court, is an iconic masterpiece of Victorian grandeur and home to the pillars of the legal establishment. It is situated in a tranquil enclave of some 11 acres (4.5ha) in central London. In 2016, the built environment of the Inn became subject to its biggest set of changes for well over a century, with major works to the Great Hall, the Library and the Eastern Terrace changing the use of various spaces.

"The original proposition in the Great Hall was simple enough," says Philip Parsons, who founded Steeldeck in 1985. "The dais provided for the top table was no longer large enough to seat ceremonial dinners as they are staged now. Rick Mather Architects, which was engaged to undertake the redesign, sourced a standard scissor design from us, even though the chosen design would have given the client more travel than required, as they only needed around 150mm (6in). The idea was that the lifts would live in the floor of the hall underneath the high-quality engineered floor from Ardern Hodges, and only be raised when the extra-large dais was required. In normal situations, no one would be aware of their presence."

## What lies beneath?

Plans were laid and contracts let before the old floor was lifted. However, when work began it was discovered that the void beneath the floor surface was not as expected. Its apparent depth was reduced by intruding iron beams and service pipes, leaving a space that was not deep enough to accommodate any type of lifting platform when it was closed, let alone Steeldeck's standard platform.

"Adding to the fun was the fact that the Great Hall Catering and Events team do not hold any engineering qualifications, as would be the case in a theater situation," continues Parsons. "The floor in question had not been disturbed for more than 100 years and any mechanisms built into it would subsequently have to pass a similar test of time."

A device was needed that would be very simple in operation, extremely compact when closed, not reliant on electrical motors or any such mechanical aid for operation, and very durable – all of which are core values of the Steeldeck brand.

The designer of the system, Nigel Parker, was not to be deterred and, after hundreds of hours of design work and three prototypes, a solution

The Honourable Society of Lincoln's Inn



Colin Crisford

Main: **The Great Hall at Lincoln's Inn set out for a ceremonial dinner**
Inset: **Steeldeck devised a lifting system beneath the old floor, to lift a dais for the top table**

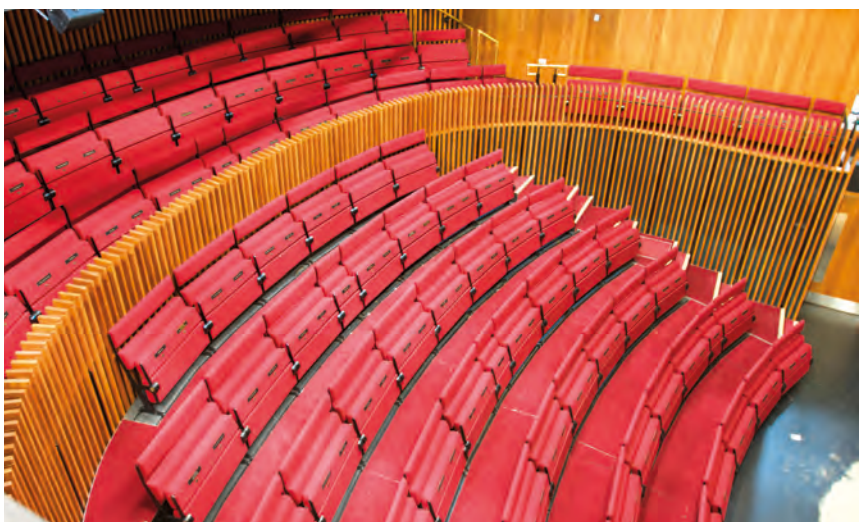
Sarah James

Above and top right: **LAMDA specified a demountable tier structure for its Sainsbury Theatre, to enable multiple uses of the space**
Below: **The fan-shaped, enclosed space made a demountable solution challenging – but Steeldeck came up with a solution**

was created. It is a very elegant device designed to deliver longevity and rigidity, avoiding the systemic weakness of scissor platforms (which are not very rigid when only lifted a short distance). In addition, the operating handles are devised so that they are removable only when the platform is locked in place, which takes away any chance of human error."

## LAMDA development

Similar issues arose in the Sainsbury Theatre at LAMDA, which, having opened its doors in 1861, is the oldest drama school in the UK. The 200-seat Sainsbury Theatre is one of two theaters which are part of the school's new £28.2m (US$37.7m) center for drama training, the other being the 120-seat Carne Studio Theatre. The Sainsbury Theatre is designed to be a small, permanent theater, akin to a mini West End theater, with a small curved auditorium facing a large stage.



The school wanted the theater and the seating system to be as flexible as possible, specifying a tiered structure that is demountable, allowing alternative uses of the space and enabling the equipment to be used in different parts of the building if desired.

## Spacial constraints

"There was a very basic issue with this," says Parsons. "If you simply made Steeldeck platforms of the correct shape and dropped them into place, you'd never get them out again because, as you go backward, the next row is larger than the one in front of it and the whole structure is contained tightly within a curved, concrete wall clad with timber. Similarly, the break lines are ideally coordinated with the seating affixed to the platforms."

The resulting design from Giles Favell is a neat solution using Steeldeck platforms, but with 'cheese piece' infills that are held in place by a device of Favell's invention known as Wedgelock.

"The beauty of this is that it is operated from the top with an Allen key device," says Parsons. "Its removal begins with releasing and lifting the wedge-shaped infills, thus allowing the remainder to be pulled forward freely. It just happens that the theater also has Mirage benches of our design and manufacture, so the final result fits together easily and does exactly what the theater wants of it."

The great thing about challenging projects such as these is that they often give rise to new products. "A device that can collapse into a very small void and then be elevated to a height a number of times higher than its closed height has a number of applications," says Parsons. "Provision of secondary levels on retractable structures is just one, but now that we have developed the system, other uses for it are bound to come to light and this is just one of the wonderful things about being presented with projects like these." ■

**www.steeldeckuk.com**

STEELDECK®

Hall Stage

*Since 1898*

# REALISE YOUR AUDITORIUM DESIGN

*RETRACTABLES*

*NIVOFLEX*

*SEATING*

*STAGES*

*FLYING INSTALLATIONS*

*TENSION WIRE GRID*

*CURTAIN TRACK*

*WINCHES*

LONDON - LOS ANGELES - NEW YORK - LAS VEGAS

Photograph, Foster & Partners

**www.steeldeckuk.com**

# Arc of triumph

A bespoke version of GDS's ArcSystem fulfilled Frank Gehry's brief for lighting at the Pierre Boulez Saal concert hall

The Pierre Boulez Saal concert hall is the latest addition to Berlin's exciting classical art community. Given that the German city is home to a number of world-class music venues, it is a measure of the new hall's impact that it has already achieved award-winning status. The Pierre Boulez Saal is part of the Barenboim Said Academy, the brainchild of musical director, pianist and conductor Daniel Barenboim, whose vision was to create a music learning center linked to a world-class performance venue. The academy exists to foster the spirit created by the West-Eastern Divan Orchestra, founded in 1999 by Barenboim and Edward Said to unite young Arab and Israeli musicians – inclusivity and diversity lie at its heart. The orchestra performed one of the inaugural concerts at the Pierre Boulez Saal.

## No room for compromise

Based in a former storage building of the Berlin State Opera, which has classical architecture, the hall was designed pro bono by world-renowned architect Frank Gehry. During the construction of this stunning facility, Gehry was adamant that there could be no compromise whatsoever of his highly sophisticated design – something that ensured the hall would achieve exceptional results, but might present a challenge to the partners charged with delivering the technical aspects of the project.

The oval, modular construction of the hall allows for a variety of configurations, setting it apart from other venues and keeping the proximity of audience and musicians as an essential ingredient. Two artfully interlocking ellipses of the tiers create an impression of weightless floating.

UK-based specialist LED lighting manufacturer GDS (Global Design Solutions) was engaged to supply house lighting for the venue. Its flagship ArcSystem was chosen to meet the challenge. The scheme was required to meet the highest possible standards of light quality and dimming, but as Matthew Lloyd, sales director for entertainment at GDS, explains, there was more to the job than fulfilling a sales order. "Frank Gehry's work is cited as some of the most important contemporary architecture on the planet, so we were aware from the outset that there was a distinct possibility that our team might be required to step into the special projects area," he says. "Fortunately, this isn't

The Pierre Boulez Saal concert hall, designed by Frank Gehry

unusual for GDS. While the range of available fixtures and the ease with which ArcSystem can be fitted or retrofitted have been key to its huge global success, we frequently encounter requests to provide bespoke solutions. In fact, component parts of the ArcSystem range, which are now standard items, began life in this way."

Above: **The hall has a bespoke lighting design based on GDS's ArcSystem LED range**

## BRIGHT FUTURE

Of all the LED lighting advances GDS has made in its 14-year history, the foremost was creating perfect dimming from 100% to zero within its award-winning ArcSystem range. Specified by designers in entertainment venues all over the world, ArcSystem is designed to deliver exceptional light quality, perfect dimming and all the environmental benefits of energy-saving LEDs. Further technological advancements include ArcSystem Fade To Warm, an LED engineered to have the capacity to emulate the characteristics of a tungsten lamp upon dimming.

In recent years GDS has become a global company with a distribution network across 38 countries, and its ArcSystem has been installed in some of the most prestigious entertainment houses worldwide. "Installations at venues such as Pierre Boulez Saal emphasize the exceptional nature of GDS products, but it is important to recognize that they are just as relevant to the needs of a smaller provincial theater, where the economic and aesthetic benefits they bring are of no less value," says Matthew Lloyd, sales director for entertainment at the company. "GDS continues to innovate toward a future, which appropriately enough, looks very bright."

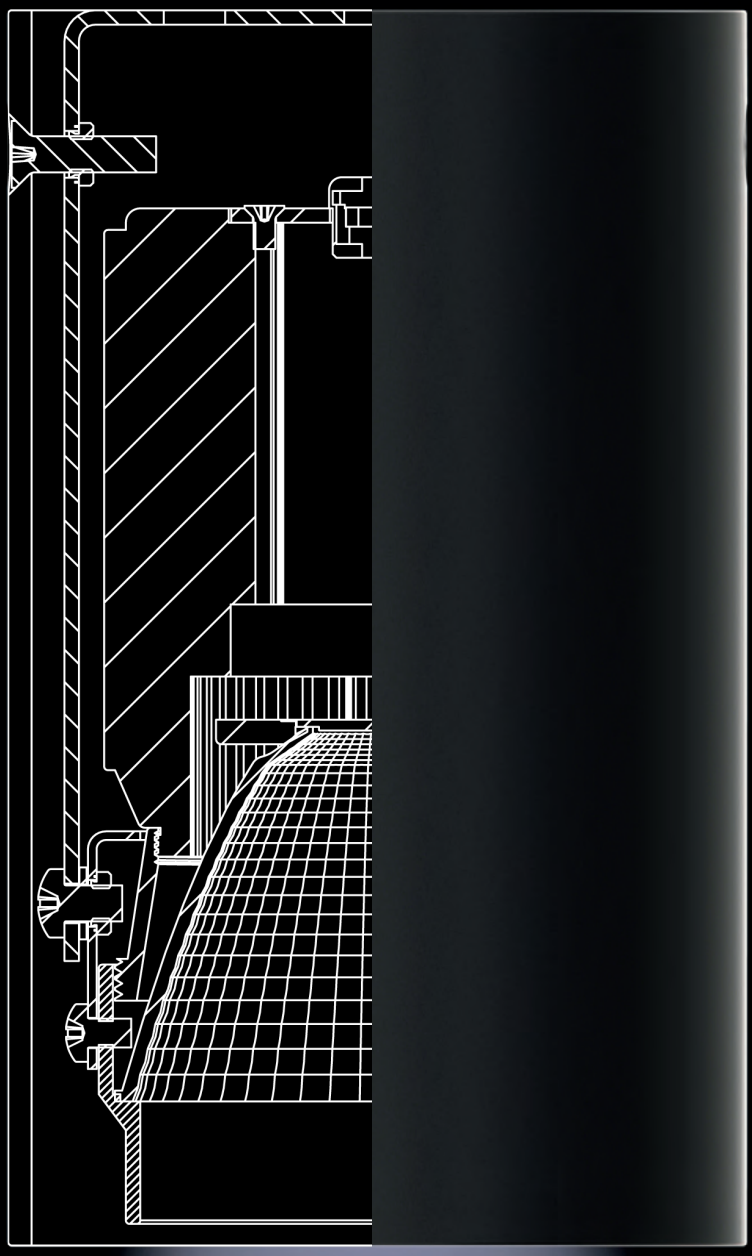
Gehry had already conceptualized the appearance of the light fittings he required and GDS worked closely with his designs to exactly fulfill the brief. "We took forensic account of the designs and having discussed them with integrators Amptown System Company (ASC) Berlin, created the fittings from scratch," says Lloyd. "While retaining the fundamental advantages of ArcSystem, each fitting was a one-off creation, specific to a particular area of the job. The nature of this particular beast is one of the most uncompromising briefs we have been given, but the finished project is simply stunning in every respect."

### Custom solution

The bespoke GDS ArcSystem fixtures were installed into the ceiling as well as being integrated in the outer circle above the stage, below the tiers, in corridors, and in proximity to doors and stairs, all placed to deliver optimum coverage regardless of the hall's configuration. The result is that this most striking interior now has a tailor-made house lighting arrangement that befits what many are calling one of the finest chamber music halls in the world. ■

**www.gds.uk.com**

Your Idea Reality...



Design
Make
Enjoy

GDS

Special Projects

www.gds.uk.com

**DESIGN**
JOHN SERGIO FISHER & ASSOCIATES

# econd life

An old church has been transformed into a performing arts center to serve students and community at the AGBU Vatche & Tamar Manoukian High School

In 1991 the Armenian General Benevolent Union (AGBU) purchased the Nazareth Church campus in Pasadena, California, USA. The site comprised a school building, a gymnasium, a multipurpose hall and a 27,600ft² (2,564m²) sanctuary with capacity for 500 people. AGBU used the campus as a community center, and in 2006 established the AGBU Pasadena High School. In 2009 these entities were renamed AGBU Vatche and Tamar Manoukian Center and High School respectively, in appreciation of a large donation made by Vatche and Tamar Manoukian. These benefactors funded the conversion and renovation of the sanctuary into a performing arts center.

Sinanian Development acted as the design/build contractor while John Sergio Fisher & Associates was the architect, and also the theater and acoustic consultant, working out of its office in Los Angeles, USA.

The goal of the project was to create a state-of-the-art performing arts center for music, musicals, plays and school convocations with excellent acoustics and the best theater system possible within the constraints of the church structure. The goals also included excellent back of house amenities for the performers and a grand lobby expansion.

## Structural changes

The center aisle pew seating was replaced with performing arts continental seating, increasing capacity to 600. The facility has a newly constructed sloped floor in the orchestra section and stepped risers in the parterre section to provide excellent sightlines. The ceiling structure remains the same, with glulam arched beams that now support two catwalk lighting positions for front of house lighting. A control room suspended from the existing structure is at the top of the stepped seating at the rear of the hall, which has acoustic absorption panels on the walls to prevent the echoes that occurred when the building was a church.

There was a social hall below the audience chamber, which has been transformed into a secondary gathering space, acting as a multipurpose/banquet room with a stage where the baptismal font was located. A portion of the room has been given over to a full-depth orchestra pit for the theater above, with has a Gala Systems lift that rises to provide additional seating or to give the main stage a thrust. The lift also moves the grand piano, which is stored in the lower level, to the stage.

The space below houses dressing rooms including star dressing rooms, along with a green room and kitchen. The lower level was made accessible by the installation of an elevator and the stage has a wheelchair lift that cannot be seen from the audience chamber. The biggest design challenge was the conversion of the altar area into a stage with motorized rigging, because of the Gothic arched cross-section.

Above and top left: **The new foyer features a dramatic roof with a cantilevered overhang**
Top right: **The venue now seats 600, but a motorized roll drop can cut the space in half for more intimate productions**
Below: **The sanctuary before its transformation into a performing arts center**

## Modern rigging

The rigging system consists of an array of 10 motorized general-purpose line sets plus three electrics battens, which are also motorized by means of drum hoists. The main drape is a motorized traveler curtain. Due to the limited fly space, dead hung battens were installed below the galleries to host the legs on a swivel so that the legs can be perpendicular to the proscenium opening and increase the wing space at the stage.

The motors are staggered between the two fly galleries to balance the loads applied to the structure. The fly galleries consist of two steel tubes spanning from glulam arch to glulam arch with a steel post going down all the way to the basement and a checkered plate on top to enable anchorage of the drum hoists. Custom support brackets were engineered to mount the head block and loft blocks to the original roof structure.

In terms of theatrical lighting, the main theater is provided with 92 circuits distributed at the stage floor boxes, stage electrics and connector strips at the front of house catwalks. Also above the control room are two rail-mounted follow spots.

The stage draperies are basic arrays of travelers, borders, projection screen scrim and a cyclorama. At the house there is a series of walk along draperies on the side walls and at the catwalks, used for variable acoustics.

The venue has a powerful AV system consisting of a center cluster and right and left line array at the proscenium. There are also multiple speakers positioned in the audience chamber for a surround sound and a video projector suspended from one of the catwalks. The AV system includes backstage communication and video feeds to the dressing rooms, green room and lobby.

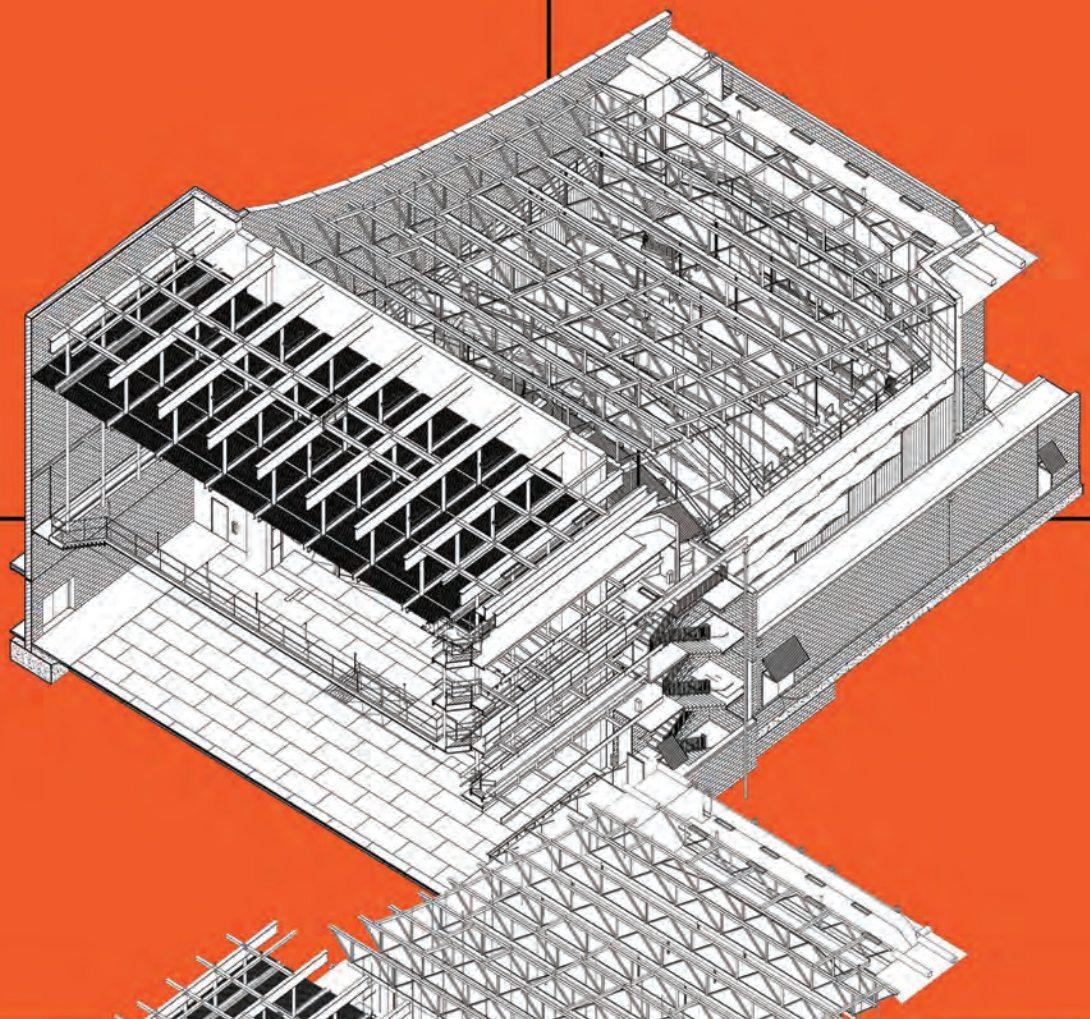
## Multifunctional solution

The audience chamber also has a motorized roll drop to visually cut the audience in half when required for smaller productions. Since the venue hosts drama, musical theater, dance, choir and orchestral performances, which all require different reverberation times, this is accommodated by adjustable acoustic draperies at the catwalks and side galleries. The RT60 ranges from 1.0-1.7 seconds.

The entrance and façade of the facility have been transformed by the addition of the new grass-enclosed lobby, which has a 26ft (8m) cantilevered overhanging roof. This provides sun protection, required because the lobby faces west. Audience restrooms were added adjacent to the lobby, along with meeting rooms. The tall lobby has a large concession front and back counter and opens up to an exterior plaza, which features many trees. There is also a transitional lower height entry lobby that serves the street drop-off.

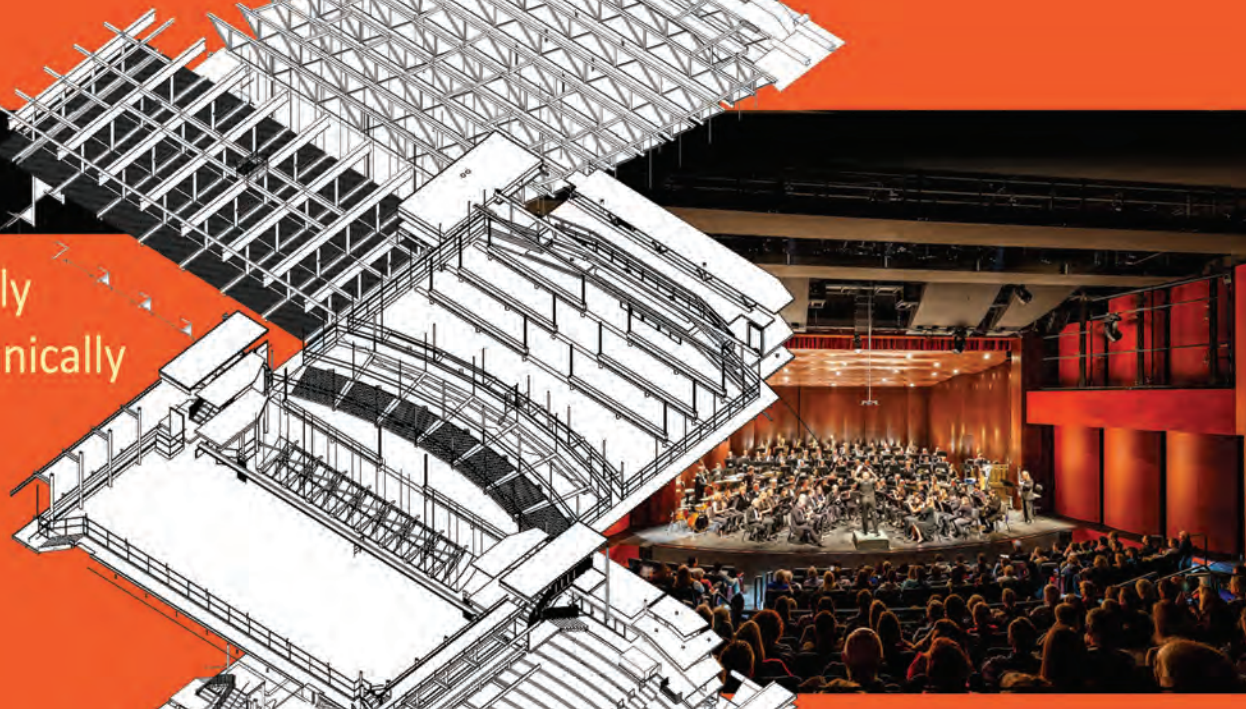
Since opening, the facility has been constantly in use by students, traveling productions and the community. ■

**www.jsfarchs.com**



# jsfa

"To create visually stimulating, technically excellent & humanistic performance facilities."





Architects/Theatre Consultants/Acousticians

**John Sergio Fisher & Assoc.**

www.jsfarchs.com

# Fast mover

The ModTruss modular system was used to create a framed portable theater that can be set up quickly at the Edinburgh Festival Fringe and in London

Established in 1984, Triple E is now a multi-award-winning company renowned for its stage tracking systems, and particularly the Unitrack system, used around the world in theaters, touring productions and cruise ships.

In 2015 Triple E became the European distributor of the American ModTruss system. Triple E launched the product at the 2015 ABTT theater show by building a ModTruss fly tower and allowing people to climb on it and rig equipment. This was a huge success and won the ABTT product of the year award.

## Modular building blocks

ModTruss components are modular pieces designed to build almost anything, anywhere, and to hold any weight. A huge line of accessories is available – including wheels, hinges, plates, mounts, ModStairs, ModRails and much more. In addition to the flexibility of ModTruss, Triple E highlights three standout features.

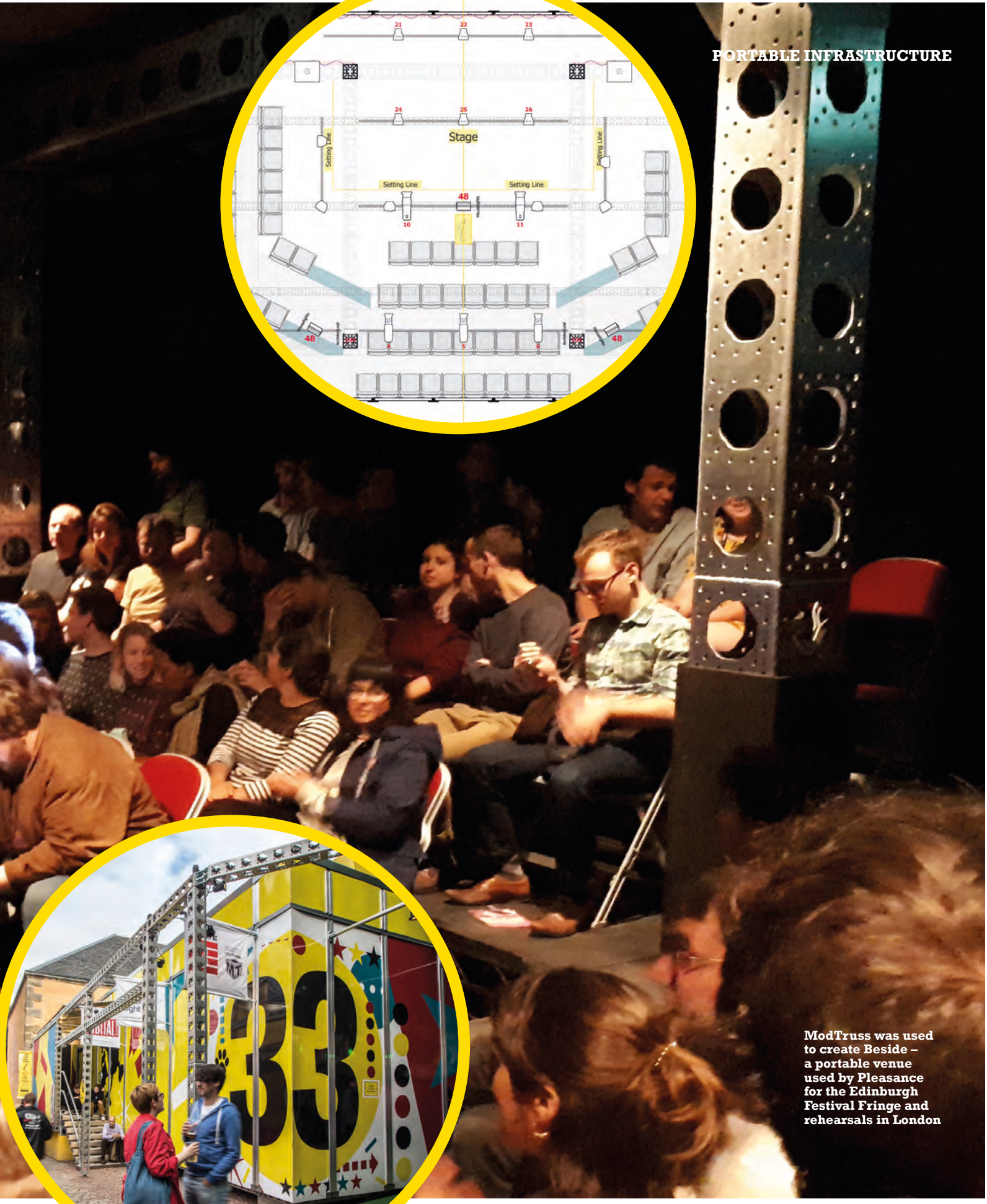
Firstly, ModTruss has a clover and bolt-hole pattern. The clover not only gives ModTruss its unique look, but the design also allows the product weight to be reduced without sacrificing strength. The bolt pattern is repeated every 3in (75mm) on all six sides, so the connection points are almost limitless.

Secondly, ModTruss can be laminated or layered for large load rating weight requirements, and can be laminated multiple times. This means that there is virtually nothing it cannot support. It can do everything a conventional truss can do and, to name a few examples, can build scissor lifts, cranes, gantries, scenery construction, multilevel sets and auditorium supports – with the ability to span great lengths.

Finally, ModTruss does not require corner blocks. Any size of ModTruss can be joined to any other piece anywhere.

## Pleasance Beside

The Edinburgh Festival Fringe is one of those events where new performance spaces are always in demand. One of the venues in the Pleasance courtyard is known as Beside. It was made from pre-assembled portable site cabins with an internal height of only 8ft (2.4m), limited





**ModTruss was used to create Beside – a portable venue used by Pleasance for the Edinburgh Festival Fringe and rehearsals in London**

by the archway into the courtyard. Pleasance director Anthony Alderson challenged Triple E to replace this little venue with a ModTruss theater, which would arrive as a flat pack and be able to give an internal height of over 13ft (4m). A genuine need had been identified at the Pleasance and the challenge was on.

The Pleasance was also about to lose its London rehearsal space. The plan evolved to produce a venue that would fit the footprint in Edinburgh and could be taken apart and reassembled in London into a smaller venue. This was a fairly complex brief but the solution has now proved itself.

## Fast assembly

The building has been designed for a fast fit-up and breakdown. The base of the theater is constructed from 12in (30.5cm) ModTruss. The flooring is created using joist hangers and timber joists. The floor is standard 1.5in (3.8cm) tongue-and-groove chipboard; the base is designed to use lifting jacks to create a level base. The main structure is formed from both 6in (15.2cm) and 12in (30.5cm) ModTruss sections. Sleeve blocks running up ModTruss masts raise what becomes the theater grid with its weatherproof roof as one piece using chain hoists or Tirfors. The way that the building is clad uses a curtain walling system developed by Triple E. The insulated wall panels for the outside are all weatherproof and the curtain walling system provides a seal to keep out the elements.

All the building's cabling runs through the ModTruss vertical supports and grid, which form the internal frame of the building. House and emergency lighting is incorporated into the building's permanent equipment. The stage lighting equipment is attached directly to the ModTruss. The new theater uses LED lighting throughout to minimize power consumption and take advantage of new equipment as it becomes available. The curtain tracking and drapes also come from Triple E.

The theater uses conventional decks and seats. Depending on whether the theater is used in a horseshoe or end-on format, the number of seats can range from 80 to 120.

## A true chameleon

For future projects, having a kit of parts that can transform into a number of different venues depending on where it is built is both practical and liberating. A company could tour the country and set up their bespoke venue wherever it chooses. Additional infrastructure can be added for dressing rooms, showers, public lavatories, foyers and catering as required.

Above: **Assembly of the Beside theater in Edinburgh; the process can be completed in as little as 48 hours**

The building is designed to be naturally ventilated but with forced air extraction. Vents are provided in the floor and in the roof, together with four extractor fans to draw air through the building. An accessible entrance for people with reduced mobility, including wheelchair users, has been incorporated into the structure.

## Transport and storage

Triple E has designed custom stillages for the transport, storage and moving of all the building components. They are designed to be fork-lifted onto trailers and have detachable castors to allow them to be rolled over rough ground. The stillages can be quickly dismantled for storage. The complete building travels on two trailers.

Designing and building a venue to a very tight fringe theater budget has been a great experience, the Triple E team believes. Like so many of these projects, working under that pressure feeds creativity to the point where ingenious solutions have been found that will keep costs down and efficiency up, resulting in a remarkable piece of work which will serve the Pleasance well for years to come. ■

**www.3-eee.com**


# We design and build portable theatres to your own specification

Triple E has supplied the entertainment industry with mechanical products to aid the assembly and construction of stage scenery since 1984.

Used at the Superbowl and a number of other prestigious projects Stateside, ModTruss' Meccano-style construction system has won awards on both sides of the Atlantic.

Pleasance Beside – the first portable ModTruss theatre at the 2017 Edinburgh Festival

Triple E Ltd

Equipment Engineered for Entertainment

**T** +44 (0)1959 570333
**E** info@3-eee.com
**www.3-eee.com**

# Changing room

Singapore's SCO Concert Hall was originally built as a conference facility, but extensive sonic reshaping transformed it into a top-class music venue

Exemplifying the avant-garde architecture of its era, the Singapore Conference Hall was completed in October 1965 – barely three months after this bustling metropolis at the tip of the Malay Peninsula became an independent nation. The building's history is intertwined with that of the country. It was the site of important addresses by the new prime minister, Lee Kuan Yew, and was designated a National Monument in 2010.

The main venue inside the structure is the 831-seat SCO Concert Hall. The name reflects the primary user, the Singapore Chinese Orchestra, which since 2001 has managed the entire Singapore Conference Hall complex. In addition to hosting a full series of concerts by the SCO, the hall is also available for use by a wide variety of other performing artists drawn from the diverse and energetic musical culture of Singapore. In addition to smaller Chinese music ensembles, the hall therefore also hosts Western classical, pop, jazz and rock concerts.

In its original incarnation, the Singapore Conference Hall was intended as a site for meetings and exhibitions. The principal venue, consequently, was not acoustically designed to serve as a concert hall. Some adjustments to the acoustics had been implemented over the years, including during a major renewal between 1999 and 2001. However, the 2010 declaration of historic status precluded the major changes to room shape and dimensions that would be required to enliven and enrich the auditorium's relatively dry acoustic signature.

## Genre defining

As a distinct genre, the Chinese orchestra is a relative newcomer to the musical world. Compositions for large ensembles of traditional Chinese instruments were largely unknown until the early 20th century, and consequently the optimum acoustical surroundings are not as firmly fixed as those for Western orchestras. Nevertheless, it was apparent that the acoustics of the SCO Concert Hall were unsatisfactorily dry and that significant extension of the room's reverberation would prove highly beneficial.

"The SCO got the green light for a major venue renovation late in 2015," recalls Vincent Cheong, responsible for business development at Coda Group, a professional audio distributor headquartered in Singapore. "They spent the next year performing in different venues with different active acoustic systems. It was a thorough and objective evaluation of what each solution would provide, both for the orchestra on stage and for the audience in the auditorium. They carefully considered the naturalness of the sound, as well as the system's flexibility for hosting various genres of performance."

**The former conference facility is now home to the Singapore Chinese Orchestra**

Images: Singapore Chinese Orchestra

Above: **The Constellation system enables separate control over acoustics in the audience area and the stage**
Top right: **The SCO performed in three different venues to assess the suitability of various active acoustic systems before choosing the Constellation system**

"It was the most impressive evaluation I've heard of," comments John McMahon, vice president of solutions and strategy at Meyer Sound, who learned of the process after his company's Constellation system was selected. "They took the same full orchestra to three different venues, performed the same musical pieces, and then surveyed the musicians and the conductors as well as administrators and advisors out in the auditorium."

### Controllable zones

Once the Constellation system was selected, Coda's Cheong and Phil Murphy worked in a coordinating role alongside the Meyer Sound Constellation team – headed by McMahon – that was charged with system design and calibration. Installation was carried out by Electro-Acoustics Systems of Singapore under the direction of project manager Patrick Chee.

## CONSTELLATION: A PATENTED DIFFERENCE

Constellation's digital signal processing employs a patented algorithm, the Variable Room Acoustic System (VRAS), developed by New Zealand acoustician Mark Poletti. VRAS places a multichannel reverberator between the distributed arrays of microphones and loudspeakers to create a separate, electro-acoustically coupled room that behaves similarly to architecturally coupled rooms.

The reverberator increases the apparent cubic volume of the physical room, while varying the gain of the microphones changes the apparent absorption or reflection of room surfaces. By electronically supplementing early reflections and regenerating reverberation, sound persists as if the room were larger, differently shaped, or constructed of materials with varying degrees of absorption or reflection.

As defined by the VRAS algorithm, these electronic reflections emulate the effect of architectural surfaces placed at different distances and angles from the sound source. The sound energy introduced into the room by the system is continually recaptured, and the process is repeated with the room reflections decaying in level according to the preset program to create the specifically desired reverberant effect. The physical reverberance cannot be nullified – making the hall sound smaller – but it can be enlarged and enhanced with essentially unlimited subtle variations.

As installed, the Constellation system is split into two separately controllable zones: one for the audience and one acting as a virtual stage shell for the orchestra.

The auditorium loudspeaker complement comprises 65 small surface-mounted loudspeakers, plus 44 recessed ceiling-mounted loudspeakers, along with 12 small subwoofers to extend reverberation to the lowest octaves. The stage system incorporates 35 loudspeakers, placed both overhead and laterally around the performance space. In addition, 35 miniature condenser microphones are deployed for direct stage sound capture (to enhance early reflections) and for ambient sensing throughout the hall.

For direct reinforcement of amplified music styles (rock, jazz and pop), SCO Concert Hall also offers a Meyer Sound line array system based around 28 Mina compact line array loudspeakers with extra bass support from three 1100-LFC low-frequency control elements flown in a cardioid configuration.

### Experimental calibration

The final calibration process for Constellation involved meticulous tuning while various performing ensembles rotated on and off the stage. "During the tuning, SCO music director Tsung Yeh was very open to experimenting with various settings that were complementary to the particular piece the orchestra was performing," says Meyer Sound's McMahon. "At some points, added lushness or resonance would work with the piece, while at other points he would want more austerity for clarity and detail. Now when they are doing rehearsals and arrangements, the acoustics become part of the equation."

The orchestra's assistant director for concert production, Jackie Tay, was the central figure in both initiating the acoustical renewal project and overseeing its progress to a successful completion. "My first experience with Constellation started six years ago," he explains. "We brought the orchestra to various venues to try out different systems to find the best for the SCO. And now, we have a platform for our musicians and audiences to enjoy this wonderful acoustical experience." ■

**www.meyersound.com**

"With the Meyer Sound Constellation System now in place, I've been overwhelmed by the change of the tone, colour and quality of the sound. It's very vibrant, beautiful and rich. The Singapore Chinese Orchestra Concert Hall (SCO Concert Hall) now has a sound that works beautifully for all types of groups; not only for Chinese Orchestras, but also for smaller Chinese ensembles, traditional Symphony Orchestras, concert bands, and even pop groups. This special system will make our SCO Concert Hall distinct from all other halls in Singapore, and in the world."

**Tsung Yeh**
Music Director
Singapore Chinese Orchestra

THINKING SOUND

Meyer Sound salutes the Singapore Chinese Orchestra for their excellence in performance, commitment to teamwork and openness to innovation.

Meyer Sound®

**SEATING**
POLTRONA FRAU CONTRACT

Left: **The MGM Macau resort**
Right: **Poltrona Frau developed a completely new seat model for the theater**
Below right: **The seats are upholstered in a fabric exclusive to the venue**

# Dynamic design

Poltrona Frau has designed and manufactured 2,000 seats for the new MGM Macau Resort Theater, which opened in February 2018

MGM Macau, the latest addition to the MGM portfolio in China, is a US$3.4bn integrated resort designed to redefine the way people experience art and entertainment through innovative technology.

Designed as the 'jewelry box' of Macau, MGM Macau offers approximately 1,400 hotel rooms and suites, as well as meeting spaces, a high-end spa, retail offerings, food and beverage outlets and, for the ultimate luxury experience, the first international Mansion at MGM. MGM Cotai is the largest property and the first private sector project ever to achieve the China Green Building (Macau) Design Label Certification.

## A dynamic theater

MGM Macau brings first-of-its-kind entertainment experiences through the Spectacle and MGM Theater, Asia's first dynamic theater with resident shows. It is also home to a unique collection of more than 300 pieces of contemporary art, intended to form a bridge between East and West, tradition and technology. Altogether, it is one of the largest permanent art collections in Macau.

Images: MGM and Scéno Plus

MGM Macau is being developed to drive greater product diversification and bring more advanced and innovative forms of entertainment to Macau as the region grows and develops as a global tourist destination.

The MGM Theater at Macau was designed by Scéno Plus and was more than two years in the making. Every detail has been carefully selected to ensure the greatest entertainment experience.

## Giant LED wall

One technologically impressive feature is the 900m² (9,687ft²) 4K (ultra HD) LED screen, which is equivalent to the size of three tennis courts and has 28 million pixels. Through an ultra HD live video system, the theater can capture audience reactions and show them full size on the LED wall, giving the public the impression of looking into a mirror.

The theater can seat up to 2,000 people in more than 10 configurations. The reconfigurable


Above: **The dynamic MGM Theater can be arranged in 10 configurations, seating as many as 2,000 people**

seating, designed to deliver optimum sightlines for every guest, was developed through a collaboration between Poltrona Frau and Gala Systems, a manufacturer of under-stage equipment and a specialist in automated multipurpose halls. The theater team can create custom arrangements for special events, ranging from traditional concerts to fashion shows, movie premieres, a 360° configuration for talk shows, product launches and international DJs.

The custom-made seats feature wooden backs and armrests and are equipped with an aisle light and push and pull cupholder. The upholstery fabric was produced exclusively for MGM.

### Great flexibility

Guests can access a wide range of food and beverage options at every level of the theater. Meeting and convention planners can benefit from the theater's scalable design and MGM Macau's professional hospitality experience to coordinate unique meetings and events for individual and corporate guests.

Poltrona Frau is proud to be involved in this hugely successful project. The seat developed for this prestigious theater is now also available for other venues, enabling audiences all over the world to enjoy its comfort and elegance. ■

**www.pfgroupcontract.com**

## BRINGING DESIGN TO LIFE

Poltrona Frau Contract has a long tradition of producing high-quality seating for some of the world's most prestigious theaters and concert halls, as well as for aircraft and luxury cruise ships, airports, hotel lobbies and other public and private spaces.

The company has completed over 1,000 projects in more than 100 countries, with a collection of 20 made-to-measure seats designed to transform the dreams, ideas and challenges of the world's most famous architects into reality.

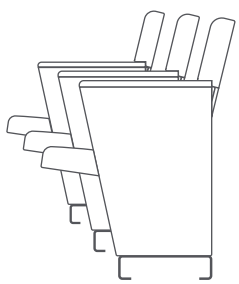
# THE ART OF CONVERGING DESIGN AND FUNCTION

**CONTRACT**DIVISION

**MGM Theatre, MGM COTAI, Macau**

Poltrona Frau 1912

Proudly producing high-quality seating for the most prestigious theaters, concert halls, convention centers and opera houses in the world.



**POLTRONA FRAU CONTRACT DIVISION**
Via Sandro Pertini, 22 Tolentino - Italy
T. +39 0733 9091 | info.contract@poltronafrau.it

**poltronafraucontract.com**

**STAGE STRUCTURE**
PROLYTE GROUP

# Take the weight

When expanding its business to supply AV equipment in Asia, Neuro Tech Asia needed a large, strong, load-bearing structure

Neuro Tech Asia has provided comprehensive AV solutions and designs for projects in China and across the Asia-Pacific region. With its team of international experts, Neuro Tech Asia has moved into areas of expertise such as technical consultancy, the support of show production professionals and staff, AV design implementation and permanent installation.

"We endorse a global approach to localized demographics, serving as a bridge between Asia and the rest of the world," says Neo Yong Hong, owner of Neuro Tech Asia. "This means we can deliver equipment and technicians that live up to western standards, following the demand of our international clientele."

The company has earned clients including Mercedes-Benz, BMW, Jaguar, Givenchy, Dior and Air France through a combination of expertise and high-quality AV equipment. For the latter, Neuro Tech Asia follows international industry standards, employing renowned AV equipment.

## Heavy load trend

"We saw Prolyte products coming in on a regular basis with touring international productions," says Hong. "With Prolyte as a highly acclaimed and recognized industry standard, we knew our choice was made. We saw an opportunity to shift from providing technicians and crew to providing equipment to international standards, as required by international production companies and promoters. Tours and productions that go into Asia are requesting the equipment they are used to working with in Europe and the USA."

Looking to create a large mother grid (a heavy duty truss construction that supports all the lighting and PA equipment), Neuro Tech Asia contacted Prolyte Group through its subsidiary office in Malaysia. The first exploratory talks were conducted by Loong Yee Hing, Prolyte Asia-Pacific's international account manager, but he soon realized that extra technical expertise was needed to translate the customer's demands into a working solution.

Based on exploratory market research, it soon became clear that the requirements in Asia are different from those in Europe. Due to the lack of venues able to suspend heavy loads from their roofs, additional measures are needed, such as installing a ground-supported mother grid, capable of being fitted with longer spans and high load-bearing resistance.

Prolyte set out to design a flexible ground-support system, based on its Mammoth range, that could be built in several configurations while maintaining a high loading capacity. Examples of these are a ground-support frame of 24 x 24m (80 x 80ft) on eight towers, with a payload of 70 tons, or a freestanding span of 60m (200ft) on two towers, with a centerpoint load of 2.15 tons.

The equipment was delivered to Neuro Tech Asia's base in Shanghai. Prolyte also planned a training program for technical crew,

**Based on Prolyte's Mammoth range, the new ground-support system could be built in several configurations while maintaining a high loading capacity**

covering how to work with the equipment, as is common when delivering larger structures. "Build-up training is vital to ensure the technical crew are aware of the often complex technical implications of working with such a large system," says Ruud de Deugd, product manager at Prolyte.

Neuro Tech Asia installed a health and safety officer to act as the contact point between Prolyte and the installation crew. The on-site training was performed by Prolyte's De Deugd and Arend Hofstee, team leader of projects, with assistance from Ralph Stockley, chief commercial officer.

Above: **As is common when delivering larger structures, technical crew received build-up training**

Boyd Yeo, technical safety director for Neuro Tech Asia, feels confident in the backup offered: "It's really good to know that we have all the expertise at hand. Ruud and Arend are very knowledgeable and great guys to work with. Furthermore, with Prolyte Asia-Pacific and support from Hing, we know we have fast access to equipment and support in our own language when we need it."

"Neuro Tech is assured of the continuous support of the Prolyte engineering team – that's part of our service," adds Stockley.

The complete ground support system, combined with D75 towers and M145RV truss, was used in April 2018 for a live show for the motor industry, where a free span of 60m (200ft) was required.

"There's no way we could have offered these specs without the Prolyte equipment," says Steven Shi, in charge of production for Neuro Tech Asia. "The system performed flawlessly, which is quite astonishing, given the sheer size and weight of all the individual elements."

With its expectations having been thoroughly exceeded both in terms of the capabilities of the equipment and the service it was offered, Neuro Tech Asia has further invested in Prolyte equipment. In June 2018 it will become the proud owner of the first Prolyte Space Roof system in Asia. ■

**www.prolyte.com**

## THE EQUIPMENT SUPPLIED

**Mammoth ground-support system:**

- 250m (820ft) M145RV Mammoth truss; with an additional 180m (590ft) on order
- 210m (690ft) D75T tower truss
- 8 x D75T deadhang mast section
- 8 x D75T to M145RV sleeve block sections
- 8 x Box-M145V box corner
- 8 x D75T tower base section
- 8 x D75T tower top section

**Additional truss:**

- 660m (2,165ft) H30V truss
- 32 x Box-30V box corner
- 700m (2,300ft) S40TV tower truss
- 40 x Box-40V box corner
- 700m (2,300ft) S52SV truss
- 32 Box-52V box corner
- 8 x ST tower base section
- 8 x ST tower top section
- 8 x ST to 52SV sleeve block for S52 truss
- 20 x Box-40-V box corner


PROLYTE GROUP

www.prolyte.com

Here at Prolyte, **whether it's a small grid or large ground support we take your safe loading seriously!** At Prolyte we take a professional approach towards loading on all scales. Invest in peace of mind, with your complete solution from Prolyte.


# Get entangled!

Performing arts centers have evolved enormously as the communities they serve change

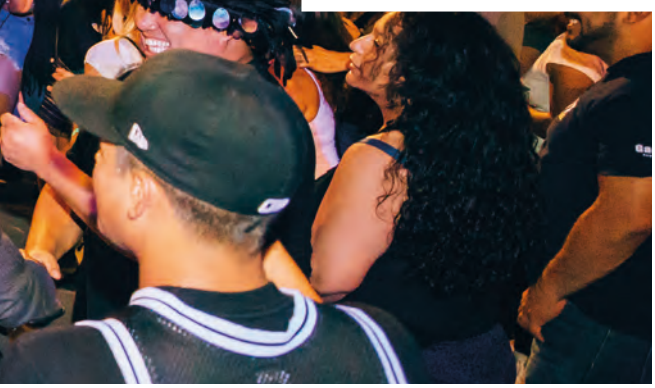
Over the past six decades, performing arts centers (PACs) have become a major, positive force in the arts and cultural ecosystem, a community anchor in many places and big contributors to the economic vitality of the sector.

By moving beyond simply being the home of traditional performing arts enterprises – symphonies, operas and ballet companies – to becoming inclusive, relevant, authentic celebrations of cultural diversity, the contemporary PAC is leading the way in ensuring that the performing arts have a place in the cultural identity of citizens and communities worldwide.

As the environment in which they operate is one of nearly constant change, PACs have evolved significantly since the notion of a campus of the arts first emerged. Communities are rapidly diversifying – economically, socially, ethnically and in terms of taste and interest. To remain relevant, successful PACs have had to rethink success.

The environment has also shifted with the advent of new technologies. It is no longer possible for a PAC to be an 'island of culture'. Successful PACs are repositioning themselves as engaged and positive forces that create public value – a concept AMS Planning & Research has termed 'entangled'[1]. This calls for a refocusing of what's programmed, how


Queensland Performing Arts Center



The Music Center

Left: **The Music Center of Los Angeles County, USA, engages the community in Grand Park**
Above: **QPAC in Brisbane, Australia, interacts with and enlivens the public realm**

it is offered and to whom, building on historic excellence and other measures.

## Excellence

The traditional home of symphony orchestras, opera and ballet companies, with occasional live theater, Generation 1 PACs focused exclusively on artistic excellence. Lavish centers, they styled themselves initially as places to see and be seen. Generation 1 PACs took root in urban places in the mid-20th century, and students of public policy and economic development soon observed the economic impacts of these centers – creating a new frame for the next generation.

## Place

Noting the secondary benefits of PACs – especially in terms of urban and economic development – both post-industrial and new cities began to invest. Building their own facilities, they often had to look far afield for content to activate the new or newly renovated spaces. With blockbuster Broadway tours emerging primarily in the late 1970s, globe-trotting artists and the explosion of subscription ticket packages, Generation 2 PACs activated facilities that were financially efficient and hosted a wider mix of artistic work.

However it was still a challenge to operate facilities which, despite their advantages as places for arts and entertainment, were often underused during the day. Seeing an opportunity, and influenced by shifting funding patterns from institutional, government and corporate partners, Generation 2 centers sought a new line of business: investing in arts education and other strategies to develop non-performance activity. These actions helped to anchor the center in its community, underlining how the facility was not just a place for arts and entertainment, but a welcoming place for learning and discovery, fully capable of responding to shifting marketplace and funding realities. This responsiveness laid the groundwork for the next evolution.

## The community center

At the turn of the century, against a backdrop of shifting support and increasing competition, PACs needed to reposition themselves once more. Almost overnight it became important to be distinct, authentic and relevant to the local community – not a clone of a PAC in another major city. Centers responded to this by dramatically increasing their focus on community-facing programs.

Generation 3 PACs now typically draw hundreds of thousands of people annually to activities other than ticketed performances. From conservatory and training programs to

Justin Namon

Jati Lindsay

Place des Arts

Above: **The Adrienne Arsht Center for the Performing Arts in Miami, Florida, USA, makes dance available for everyone**
Top right: **The John F Kennedy Center for the Performing Arts in Washington, DC, USA, invites the community for free performances at the Millennium Stages every day**
Right: **Place des Arts in Montreal, Canada, activates 'L'Espace Culturel' with performances, education programs and information**

workforce initiatives and myriad partnerships, Generation 3 PACs work to be inclusive and community-based, responding to dynamic local demographics, changing artistic interests and new opportunities in ways that break down traditional barriers. Collaboration is a watchword, recognized for its importance to not just operating efficiencies but also to mission fulfillment. Civic 'entanglement', where PACs are deeply intertwined in a complex system creating public value, began to emerge as a top priority.

### Entanglement at the nexus

Generation 4 PACs facilitate opportunities for cultural expression through performances, education initiatives and community programming. The wide range of activity on their stages and campuses, in their communities and across the virtual world, enables diverse audiences to find themselves reflected there.

Generation 4 centers occupy the roles of collaborator, partner and educator. From commissions to diversified social marketing initiatives, and sophisticated facility operations to first-class guest services, the contemporary PAC incubates new ideas, innovates new means of delivery and leads in facilitating civic discourse and critical dialog. Questions like, "How can we make a profound and meaningful impact on our local community?" are regularly engaged.

The Generation 4 PAC is more than a venue; it is a brand that can be found throughout the community in schools and hospitals and digitally around the world. But what's next?

### Authentic and an anchor

Most PACs are generally considered successful enterprises, working hard to operate in a dynamic, high-risk environment. But leaders are taking note of the changing world, realizing that they need to engage a broader public. Centers need to be more diverse, informal, looser, funkier, participatory and younger. The emerging priority for next-generation centers is to welcome all people authentically. Emerging Generation 5 PACs have begun to recognize their role as community or even regional anchors, alongside other vital not-for-profit players such as educational institutions and hospitals, as well as government, with influence on civic, social and economic outcomes that affect millions of people in nearby and distant locations. ■

1) Adapted from Mark Moore's *Recognizing public value*, Boston, Harvard University Press (2013)

**www.ams-online.com**

## EVOLUTION OF SUCCESS

The E4 framework refers to how the definition of success has evolved for – generally Western – arts and culture enterprises.

Excellence (1950s-1980s) of artistic products, experiences and facilities was the essence of success in this early stage of development. Star artists were leveraged to gain credibility in rapidly growing urban centers.

Efficiency (1980s-1990s) of operations became an additional – or principal – priority in this second generation. Driving attendance through strategies such as subscriptions and email marketing took increased prominence. Touring productions that could amortize costs across many markets proliferated. The focus became enabling organizations to scale operations while aggressively controlling overheads.

Effectiveness (1990s-2010s) emerged as shifting demographics and the 'culture wars' became urgent areas of focus for leaders in arts and culture. Describing impact and outcomes, rather than attendance and outputs, became critical to success.

Entanglement (2010s-present) is the core of today's definition of success. This term is AMS's way of referencing the deeply interconnected partnerships, collaborations and commitments that weave together arts and culture organizations with a multitude of other entities, spanning public and private, local to international, and touching on a wide variety of artistic and cultural expression.



# Leverage Your Data

to communicate your value

**Measure impact, improve performance and drive efficiency.**

Our Analytics Suite makes it simple to contribute your data to the fastest growing set of proprietary PAC metrics in the industry.

View insights in realtime according to the metrics that matter to you.

ams analytics

Photo Credits: Orlando: Dr. Phillips Center for the Performing Arts; Eccles: George S. and Dolores Doré Eccles Theater, Salt Lake City, UT

**Consulting Services:**

- Facility Planning
- Business Planning & Strategy
- Cultural Policy
- Audience and Market Research
- Benchmarking

For 30 years, AMS has been helping clients define, plan and develop successful ventures in the arts.
**Maximize your resources... Deliver on your mission... Connect with us...**

AMS
PLANNING & RESEARCH
for the Arts and Entertainment Industries


**(800) 877-3282**
**ams-online.com**
**ams@ams-online.com**

# Modern history

A sophisticated wireless audio system is part of a raft of technological upgrades at the historic Staatsoper Unter den Linden in Germany's capital city, Berlin

Berlin's legendary 18th century opera house, Staatsoper Unter den Linden, has undergone comprehensive architectural, acoustic and technological renovations in recent years. After its symbolic reopening on German Unity Day on October 3, 2017, the Staatsoper was closed again to update the venue to handle the complex technical challenges presented by modern opera productions. Regular performances relying on a Shure Axient Digital system with 34 channels started in December 2017.

The two systems integrators – ASC Amptown System Company (as ARGE lead) and Salzbrenner Media – collaborated to upgrade the Staatsoper's media technology. Architecture firm hg merz was responsible for the building's historically appropriate renovations, while acoustic engineers from Peutz Consult Berlin undertook measures to improve the acoustics. These measures included raising the main hall's domed ceiling by 4.5m (14.8ft), increasing the reverberation time from 1.1 to 1.6 seconds.

## Wireless security

ASC was responsible for the video and audio systems and IT network. To ensure complete wireless coverage throughout the building, ASC installed a fiber-optic-based HF distribution system from The Wireless Works. This open infrastructure enables the connection of various wireless systems, wireless microphones, the wireless intercom and also in-ear monitoring. "The HF transmission technology was one of the special challenges in this project," says Stefan Thomsen, ASC's senior sales manager for communications and information systems. "The various radio systems are used in different parts of the building, some of which are far apart from one another. Complete radio coverage must be guaranteed in such situations. The wireless full-duplex intercom system BTR-800, supplied by RTS, even requires a bidirectional infrastructure."

HF signals are sent and received bidirectionally by decentralized distributed remote units in various areas of the opera house.

## Failsafe transmission

To ensure HD sound and the reliable and failsafe transmission of the wireless signals, ASC installed a 34-channel Shure Axient Digital system. Currently using the AD version of the flagship wireless system introduced by Shure in 2017, the venue will soon switch to the remotely controllable ADX transmitter platform. This move is intended to provide the opera house with maximum operational security in the coming years.

Based on the previously calculated frequency setup, the integrated Axient Spectrum Manager can send disturbance-free frequencies to the ADX transmitter in real time, automatically. This ensures interference in heavily used HF environments can be avoided without affecting the audio signal.

"Having the utmost reliability and fail safety were the most important parameters for the new wireless system for us," says Christoph Koch, head of the sound department at the Staatsoper.

Above: **The Staatsoper Unter den Linden reopened in December 2017 after a historically sensitive renovation including technological upgrades**

Marcus Ebener

Gordon Welters

Amptown System Company

## HISTORY LESSONS

The renovations at Deutsche Staatsoper had to be sympathetic to a storied history. Built between 1741 and 1743, and opened in 1742, before the building work was concluded, the venue was the first detached opera house in Germany. At its birth it was the largest opera venue in Europe. Sadly, the building suffered damage in World War II, and had to be reconstructed, a project that benefited from the vision of architect Richard Paulick.

The latest refurbishment project was instigated in 2008, with the planning entrusted to hg merz. As well as general renovation and extension works, the brief included improving the auditorium's acoustics, sightlines and stage equipment, and updating AV media and stage management equipment to world-class standards – all while staying true to the building's history. The opera house has heritage-protected status.

Performances resumed on December 7, 2017 – exactly 275 years on from the opera house's original opening.

"On one hand, that's guaranteed by the long battery life of the Axient Digital system. But we're also very impressed with how quickly the system recognizes radio interference, selects a free frequency from the backup list, and within a fraction of a second switches over without being audible. Considering the demanding spatial situation at the Staatsoper Unter den Linden, we preferred to have a sustainable and future-proof system for our diverse productions."

Along with the Quadversity receiver technology, which is used to reduce the risk of signal failures, interference and dropouts, Axient Digital also offers a unified switching bandwidth (166MHz) for receivers and transmitters.

The team at the opera house also appreciates the tabletop charging stations for handheld and bodypack transmitters, as well as the digital ADX1M micro-bodypack transmitters with an integrated antenna.

### Flexible use

"The scalability plays an important role for the Staatsoper Unter den Linden," says Christoph Wegner, project manager for ASC. "With just one receiver platform that works with two types of transmitters, Axient Digital provides the Staatsoper's sound department with a wide selection of professional features, including reliable HF performance, impressive range, and top signal and sound quality. This allows us to approach modern productions with varying requirements in a flexible fashion."

The Staatsoper now has access to state-of-the-art wireless technology in the form of 34 bodypack and eight handheld transmitters from the Axient Digital AD series. Koch's sound department also relies on Shure in-ear monitoring from the PSM 900/1000 series with a total of 40 receivers. ■

Gordon Welters

Top and above: **A new reverberation gallery was created to improve acoustics**
Above right: **The drive rack including Shure AD4D Axient Digital receivers and Shure AXT600 Spectrum Manager**

**www.shure.com**

## SHURE START

Founded in 1925, Shure is a leading manufacturer of microphones and audio electronics. The company's diverse product line includes wired microphones, wireless microphone systems, in-ear personal monitoring systems, conferencing and discussion systems, networked audio systems, award-winning earphones and headphones, and phonograph cartridges.

Shure is headquartered in Niles, Illinois, USA. The company also has regional sales and marketing headquarters in Eppingen, Germany, and Hong Kong, China, with more than 30 other manufacturing facilities and sales offices throughout the Americas, EMEA and Asia.

480MHz 490MHz 500MHz 510MHz 520MHz 530MHz 540MHz 550MHz

# AXIENT® DIGITAL

# WE HEARD YOU.

| | |
|---|---|
| 166 MHZ | Wide tuning up to 166 MHz across all receivers and transmitters |
| | Up to 63 active channels per 8MHz TV band in High Density mode |
| | True digital diversity with Quadversity™ and transmitter frequency diversity |
| | Two- and four-channel receivers |
| | ShowLink® remote transmitter control |
| AES3 + Dante™ | AES3 and redundant Dante digital audio |
| 2 ms | Industry-leading two milliseconds of latency |
| | The first micro-bodypack with an internal self-tuning antenna |

Axient Digital uses the most innovative wireless technologies in the world, delivering uncompromising performance – anywhere, every time.

Learn more at **shure.com/axientdigital**

SHURE®
LEGENDARY PERFORMANCE™

© 2018 Shure Europe GmbH

# Transformative power

Configuration flexibility was the goal for two recent projects – the Sheikh Jaber Al Ahmad Cultural Centre Multipurpose Hall and Barvikha Luxury Village Concert Hall

Above left to right: **Two floor configurations in BLV Concert Hall; the seating wagon in JACC's Multipurpose Hall; Spiralift lifting in the BLV Concert Hall; and rigid chain lifting in the JACC Multipurpose Hall**
Below: **One of four basic configurations possible for the BLV Concert Hall**

Demand for multifunctional auditoria has led to a revolution in stage technology – the ability to reconfigure floors with lifting platforms to create different seating layouts. This kind of technology is a powerful tool for today's production teams, creating better experiences for audiences and enabling truly multipurpose halls.

By adopting this multipurpose philosophy, modern convention centers and performing arts centers can run programs all day long, bringing the community together and advancing their cultural and educational missions.

## JACC Multipurpose Hall

Svetlost Teatar has worked on two projects recently that were targeting this kind of multifunctionality. The Sheikh Jabar Al Ahmad Cultural Centre (JACC) and Sheikh Abdullah Al Salem Cultural Centre are key parts of the new Kuwait National Cultural District, a world-class cultural development in Kuwait City.

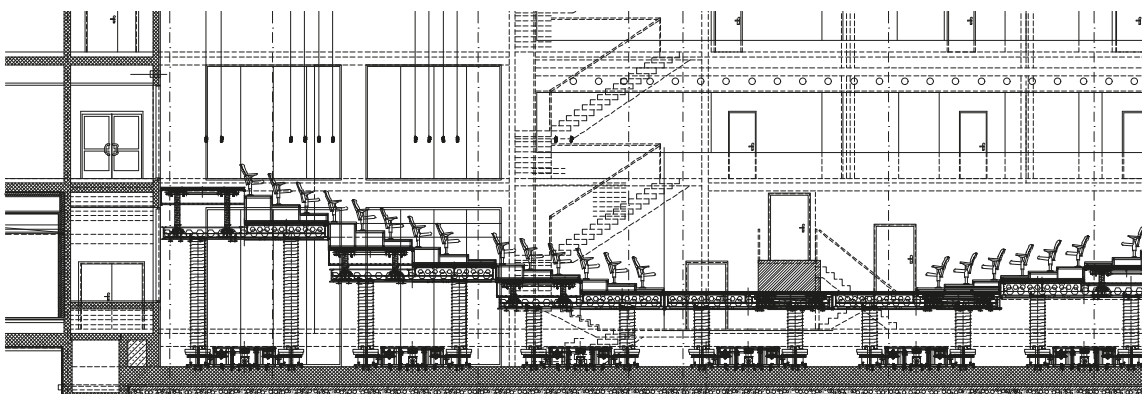
The JACC complex features four buildings, housing 11 halls in total. As part of the conference building, the 450-seat Multipurpose Hall is designed to support government, inter-government, academic, corporate, and private conferences and events.

The stage technology in the hall includes eight 2.9 x 18m (9.4 x 59ft) platforms, a 3.5 x 18m (11.3 x 59ft) transport platform and fully motorized and computer-controlled rigid chain lifting units. These enable the 485m² (5,220ft²) floor to be transformed from flat into a tiered auditorium configuration. The seating wagon system is stored on the lower level of a double-deck platform when the floor is flat. A tension wire grid with power point hoist lines provides engineering support from the top.

As well as this stage engineering system, Svetlost Teatar was responsible for designing and building the production lighting and AV systems for the JACC, in collaboration with Al Hani Construction Company, SSH Architects and Theatre Project Consultants.

## BLV Concert Hall

Barvikha Luxury Village (BLV) is a private retail complex on the outskirts of Moscow, Russia.

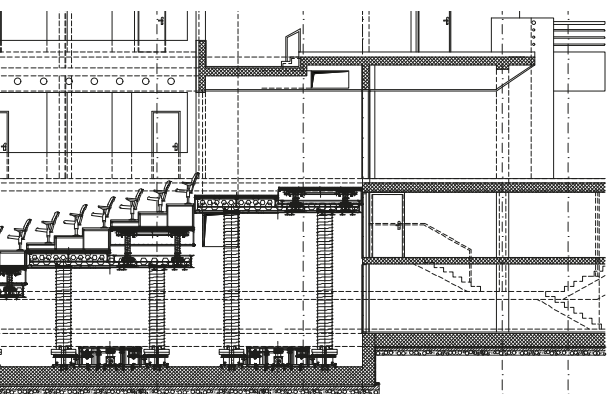


It features an open-air 600m (1,969ft)-long pedestrian street, lined with world-famous fashion outlets and restaurants, and with a hotel at one end and the Concert Hall at the other. The multipurpose venue has four basic configurations, for theater, cabaret, fashion shows and presentations.

To transform the 860m² (9,257ft²) floor, there are eight 5.4 x 20m (17.7 x 66ft) platforms and fully motorized and computer-controlled Spiralift lifting units. More than 80 seating wagons – each measuring 2.7 x 2.5m (8.9 x 8.2ft) – are stored in a separate offstage area when not in use. Half of each platform (three rows) has a secondary lifting function to optimize sightlines. The single-tier end-stage theater configuration has capacity for 700 people, while the dual-tier center-stage fashion show configuration can seat 840. Upper-stage machinery moves to correspond to each configuration, with point hoist lines, moveable power fly bars and a catwalk grid. Svetlost Teatar also designed and built the production lighting and AV systems. Other actors on the project included construction company PSP Farman Holding and architect Project Meganom.

On both projects, Svetlost Teatar demonstrated its in-house expertise in creating custom stage engineering systems that enable multifunctionality. Motorized lifting modules enable venues to change their configurations at the push of a button, inspiring innovative uses for the space. ■

**www.steatar.rs**




**STAGE MECHANICS**

**STAGE LIGHTING**

**SOUND AND VIDEO** SYSTEMS

**UPPERSTAGE** MACHINERY

**CONTROL SYSTEMS**

**UNDERSTAGE** MACHINERY

**SVETLOST TEATAR**

**Milovana Šaranovića 11,**
**11000 Belgrade, Serbia**
**t:** + 381 11 3977 570
**t:** + 381 11 3977 930
**f:** + 381 11 3978 014
**e:** office@steatar.rs
**w:** svetlost-teatar.rs

**Branch offices**
**Svetlost teatar, Russia**
**a:** Орджоникидзе дом 11
строение 1А,
115419 Moscow, Russia
**t:** + 7 925 6607226
**e:** info.ru@svetlost-teatar.org

**Svetlost teatar, Macedonia**
**a:** Bulevar VMRO 1/2-8,
1000 Skopje, Macedonia
**t:** + 389 23 21 22 00
**e:** info.mk@svetlost-teatar.org

BOZAR

# Tailor swift

The Center for Fine Arts in Brussels has chosen a custom mobile system for its seats, so they can be cleared quickly for standing events

Above: **BOZAR's seating is customized to give the impression of perfectly horizontal lines of seatbacks**
Opposite page: **In 2018, Fibrocit fitted every ground floor seat with a mobile system for easy clearance, and renewed the upholstery and shells where required**

The Center for Fine Arts in Brussels (BOZAR), Belgium, is the creation of famous Belgian Art Deco architect Victor Horta. It opened its doors in 1928. The center combines exhibition spaces, lecture rooms and three concert halls, the most renowned of which is the Henry Le Boeuf Hall, with 2,100 seats. This hall is ranked among the five best concert halls in the world for its acoustics and is home to the Queen Elisabeth music competition.

Since it opened, BOZAR has commissioned seat specialist Fibrocit a total of five times to design, build and install perfect concert hall seats. In the 1950s, the seats were renovated in alignment with the Horta style of the 1920s. Then in 1976, the Henry Le Boeuf Hall received a more modern makeover.

In 1999, BOZAR decided to restore the acoustic qualities of the original Victor Horta setting. Although more than 70 years had passed, BOZAR partnered with Fibrocit again to construct and install an exact replica of the 1928 version – and so the classic seat model Mozart was given a new lease of life.

With a harmonious atmosphere in mind, BOZAR wanted the impression of a straight horizontal line of seatbacks throughout the ground floor of the hall. As the ground floor has a sloping shell shape, every seat had to be adapted in terms of height and width, based on its specific position. The seats look the same, but are not identical. With this project, Fibrocit mastered the art of customization.

## Customization on a grand scale

The company has built and installed custom fixed seats for cinemas, theaters, opera houses, cultural centers, auditoria, amphitheaters, conference halls, gyms and stadia since 1920. Fibrocit's vision is to give visitors to public spaces the best possible seating, taking advantage of all available space and tailoring its solutions to the venue's layout. Ergonomic, technical, acoustical, environmental, qualitative and security aspects all influence the final design. Adapting every seat in terms of height, depth, width and finish requires a profound knowledge of the trade.

In 2015, BOZAR approached Fibrocit with a new request. It wanted to use the Henry Le


BOZAR

Boeuf Hall for standing events, and so needed to be able to clear the ground floor's 660 seats swiftly and easily. Fibrocit provided advice and assistance with the development of the project prior to BOZAR launching the official public bid in 2017. Fibrocit won this bid and got to work.

## Strict schedule

Every seat on the ground floor had to be equipped with an easy-to-use mobile system that allows for swift clearance and occupation of the hall. The installation had to take place during the winter season. Because the concert season continued during the renovation, Fibrocit had to follow a strict two-week schedule, during which 20-80 seats at a time were taken to the factory, remodeled and equipped with the mobile system and re-installed. At the same time, Fibrocit took the opportunity to renew the mohair fabric and the massive oak plywood shells wherever necessary. The entire project was completed at the end of May 2018, just in time for the first standing event in June 2018. ■

**www.fibrocit.com**


fibrocit®
fixed seating projects

***The same but not identical***
*to make it perfect*

It is our vision to let visitors enjoy the best possible seating solutions. That is why we build custom made fixed seating solutions for various sectors: cultural, educational, business, sports, and hospitality sector.

At FIBROCIT we do not work with a product catalog. Strange? Not really, because every seat is different: to obtain a perfect final result they may look similar, but they are not identical. We work this way in order to make optimal use of the available space. And if this means that a seat needs to be raised, lowered, widened, narrowed or equipped in a different way, we will do that.

HAVE A LOOK AT OUR CUSTOM MADE PROJECTS
ON OUR NEW WEBSITE: **www.fibrocit.com**

FIBROCIT - HOSPITAALWEG 1C BUS 2, 8510 MARKE - BELGIUM
+32 (56) 22 56 99 - INFO@FIBROCIT.COM

# Shared vision


Alan Williams

Intelligently designed theaters and acoustics can improve shared experiences for audiences

Above: **Storey's Field Centre**
Below: **The Garden Quadrangle Auditorium at St John's College Oxford**
Opposite page: **The Benjamin West Lecture Theatre**

Theater planner and acoustician Sound Space Vision (SSV) believes that sharing experiences reflects our common humanity and has the ability to transform lives. In early 2018, SSV delivered three projects that exemplify this vision. With each, SSV partnered with a prestigious institution that is forging its way through the 21st century with new or refurbished buildings specifically designed to deepen the intensity of experience.

Storey's Field Centre, part of North West Cambridge Development's brand new community, Eddington, in the UK, was conceived as a community hall encompassing meeting rooms and a large multipurpose space. Following architect MUMA's lead of creating a public space that aspires to a higher purpose and inclusive community engagement, as well as the client's express wish for a hall that can cater for very diverse programming, SSV provided theatrical and acoustical specifications that are not merely functional, but also elegant and sensitively designed.

The venue's main hall is responsive, reactive and flexible enough to host everything from lectures by Nobel laureates to Zumba classes, from chamber music to visiting rock and pop bands, to local events. Now the town's hub, Storey's Field Centre interacts with and contributes to its new community in a very tangible and positive way.


David Fisher

## St John's College Oxford

St John's College Oxford, although arguably one of the UK's most established communities, is continually renewing and revitalizing its presence. The college's Garden Quadrangle Auditorium was built in 1993, but by 2015 the faculty and students were eager to deepen their engagement in music and theater. Meanwhile, AV and lighting technology had moved on.

With architect Alan Berman, SSV conceived a new embracing form, seating layout, ramps and lower balcony height for the auditorium. Later, collaborating with BGS Architects, SSV detailed shallow mechanical lifts for the stage extension, new stage lighting for lectures, recitals and drama, and front and rear projection. A new toroidal sound reflecting surface sensitively mitigates the acoustical focus of the dome, and an electroacoustic enhancement system specified by SSV develops natural-sounding resonance for music and support for speech. The Garden Quad Auditorium has provided the college and its environs with a venue of renewed distinction, expanded purpose and optimum accessibility.

## Royal Academy of Arts

London's Royal Academy of Arts celebrates its 250th anniversary in 2018 with a grand refurbishment of its revered buildings by David Chipperfield Architects and conservation

specialists Julian Harrap Architects. SSV contributed seating layouts, sightlines and performance lighting and sound, projection specifications for the Benjamin West Lecture Theatre, as well as acoustical consultation to other new and refurbished gallery spaces.

## Old and new

This linking of new spaces with the historic buildings provides not only a physical connection, but also a psychological transformation of the Royal Academy for public interaction and expanded learning programs that will reach out to modern audiences. Specifically, the lecture hall will serve the venue as a presentation space, hosting lectures and lively debates both *in situ* and remotely, with infrastructure to allow for connectivity through video and internet capabilities.

These three Sound Space Vision projects reflect and contribute immeasurably to their communities by fostering and facilitating their sense of belonging, while developing audiences of the future. ■

**www.soundspacevision.com**

Simon Menges for Royal Academy of Arts


**DESIGN**
DIAMOND SCHMITT ARCHITECTS

# Fitting memorial

How do you go about refurbishing a Grade II listed hall while preserving its character? This was the challenge faced by Diamond Schmitt Architects and Ayre Chamberlain Gaunt when reimagining Memorial Hall

Memorial Hall, at the center of the Marlborough College site in the English county of Wiltshire, opened in 1925 to honor Marlburians lost in World War I. Their names are engraved in the stone lining the curved ambulatory around the perimeter of the hall – a room intended to be a beautiful, light-filled place of quiet contemplation yet also a vibrant memorial full of song and dance. Therein lay the problem.

The raked 600-seat auditorium is an enclosed classical amphitheater, a perfect semicircle with a thrust stage at its center. While this shape allows for clear acoustics in the open air, once enclosed, echo and excessive reverberation are problems not experienced to the same degree in halls of other dimensions.

## The problems

Numerous features of the original auditorium compounded the venue's problems. At 8.6m (28ft), the proscenium arch was too narrow to accommodate the college's desire to place a 60-piece orchestra on stage. The sightlines were poor close to the stage and the small back of house was cluttered with dangerously tortuous staircases. The original design had little architectural lighting and no overhead theatrical lighting for the thrust, so the flat, concrete ceiling was a web of trusses and pipes hung from chains and draped with cables.

An unsightly technical booth and raised additional seating against the back wall further eroded the room's natural grace, and the facility also lacked basic amenities such as a lobby, a coatroom, washrooms, change rooms, green rooms and ventilation.

## Renewed purpose

The end result, according to A J Diamond, principal at Diamond Schmitt Architects, had to reinvigorate the building's original purpose as a theater and a memorial, with clear distinction between the restoration of original elements and the addition of new features. "The best way to honor the original architecture was to help it remain functional," he says. "We applied the benefit of 100 years of innovation and advances in theater craft to create a top-tier environment."

The proscenium was widened to 12.1m (39.7ft) to improve lateral sightlines and acoustic

connection to the audience chamber. Large 'barn doors' at the stage perimeter direct sound energy toward the audience for smaller ensembles, or relieve excess sound into the stagehouse for larger performances.

A unique system of variable and fixed acoustic reflectors is positioned above the stage, designed in collaboration with acoustic consultant Neill Woodger. "We took inspiration from a non-repetitive mathematical shape called a Penrose tile to create a three-dimensional floral design to effectively disperse sound throughout the hall," says Matthew Lella, principal at Diamond Schmitt Architects.

Reversible convex panels line the perimeter to further support acoustic attenuation and can be primarily absorptive or diffusive as required by the program.

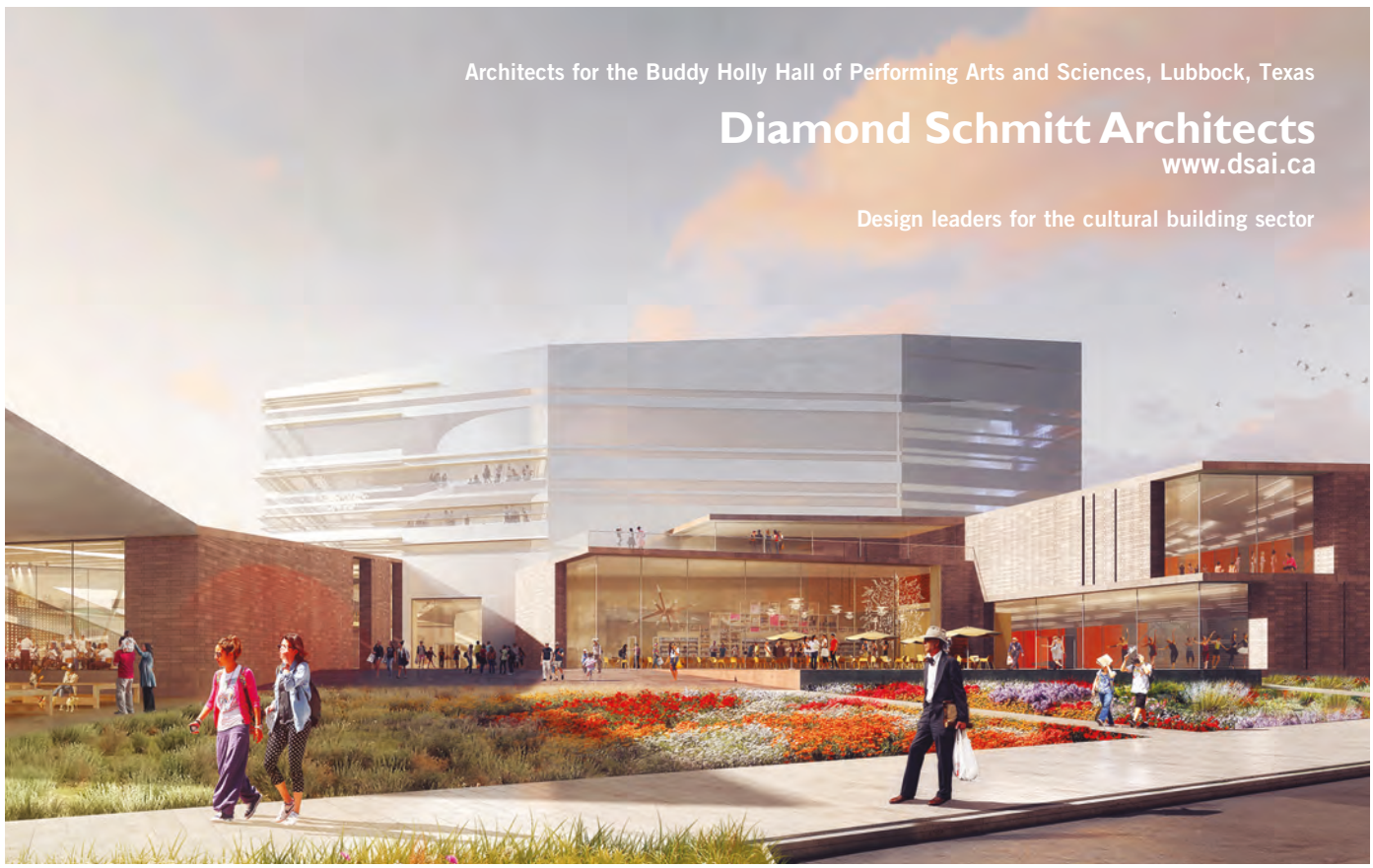
## Sight for sore eyes

Re-raked front rows and a raised stage to align with cleared-out wings improve sightlines. New passages improve access and connect to new entrance lobbies and washrooms on the lower level. Replacing the 1960s technical booth is a streamlined transparent perch suspended from the walls that preserves clear views of the original cornice above. The bench row seating remains in place, updated in acoustic fabric.

The renewal of Memorial Hall allows this underused facility to function as a proper theater for speech, music and drama, for both student and public performance. "We wanted a modern design with a natural order – a clear but relaxed structure perfectly at home in this classic English building," concludes Lella. ■

**www.dsai.ca**

Above: **The raked 600-seat auditorium is an enclosed classical amphitheater**
Opposite page: **The refurbished Memorial Hall can now function as a proper theater for speech, music and drama**



# Small wonder

Seating just 320 and optimized for multifunctional use, the main concert hall at Lapland's Korundi House of Culture is perfectly in tune with its community's needs

Images: Arto Liiti/Rovaniemi Art Museum

Rovaniemi, unofficially known as the capital of Lapland, is a small Finnish town with a lot of potential for tourism and exotic environmental experiences. It draws people from all over the world to visit Santa Claus, who sits in his post office throughout the year joyfully replying to children's letters, and to experience the exotics of the northern hemisphere above the Arctic Circle, including the midnight sun and the polar night.

Rovaniemi is not only the mysterious north, however. It is also the living cultural center of the northern part of Finland, with lively arts, theater and music scenes. Korundi House of Culture is the heart inside this heart, serving as the town's cultural centerpoint.

## Historic background

The building was founded in 1933 as a mail bus depot. Having survived World War II, it was expanded using bricks from other, ruined, buildings in the area. More recently, the depot was transformed to house the Rovaniemi Art Museum and a small concert hall for the Lapland Chamber Orchestra, the northernmost professional orchestra in the European Union. The aim during the transformation, led by architect Juhani Pallasmaa, was to successfully marry the building's historic past with a more modern architecture.

Top and below: **A 1933 mail bus depot was expanded and transformed to house the art museum and concert hall**
Above: **The hall seats 320**
Main: **The "minimalist music box" design is optimized for orchestral performances**


Korundi House of Culture opened in May 2011. Akukon, a Finnish consultancy, designed the acoustics, and the spatial and technical functionality of the concert hall and other multipurpose areas. The brief was to optimize the concert hall for the Lapland Chamber Orchestra, although some degree of multifunctionality was required – both to suit conference use and for some contemporary chamber music, which requires a shorter reverberation time. The concert hall is also used for recording sessions and audio-visual presentations.

## Visual acoustics

"The concert hall was conceptualized as a minimalist music box," comments Pallasmaa. "The pivotal goal when designing the interior of the concert hall was to create visual acoustics. The warm-toned space divided by panels and battens is reminiscent of the interior of an aged string instrument."

The hall has proven a success functionally and acoustically, and has been well received by the orchestra, the media and the audience. After opening night, the hall was the subject of rave

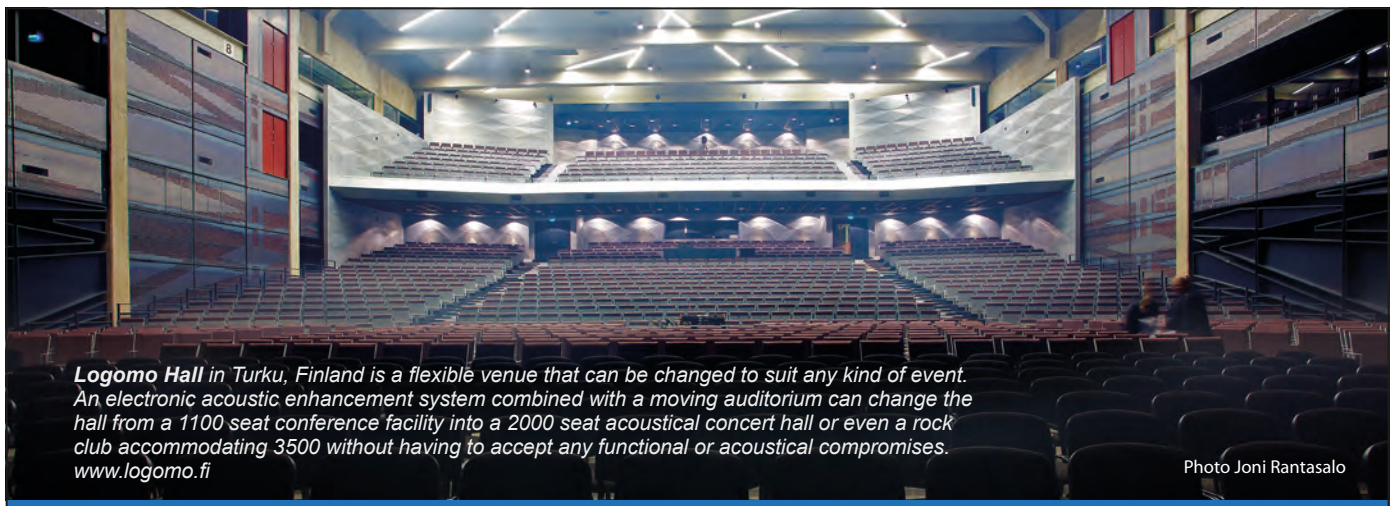
## VITAL STATISTICS: THE MAIN CONCERT HALL

- Width: **13.5m (44ft 3in)**
- Height: **12.3m (40ft 4in)**
- Length: **24m (78ft 8in)**
- Volume: **3,400m³ (120,000ft³)**
- Stage height: **0.7m (2ft 4in)**
- Stage depth: **6.5m (21ft 4in)**
- Row spacing: **1m (3ft 3in)**
- Seats: **320**
- Rows: **17**

reviews, even in the major Helsinki newspapers, which is rare for a small provincial concert hall. The artistic director of the Lapland Chamber Orchestra, John Storgårds, is certainly happy: "At last audiences are able to hear the orchestra's nuances properly."

The building has a total floor area of 5,300m² (57,000ft²), with seating for 320 in the main concert hall – just the right number of seats for a small community. The size and volume, as well as technical facilities, are optimized to the needs of the venue's users in every way, and the work was achieved within a limited budget. ■

**www.akukon.fi**



***Logomo Hall** in Turku, Finland is a flexible venue that can be changed to suit any kind of event. An electronic acoustic enhancement system combined with a moving auditorium can change the hall from a 1100 seat conference facility into a 2000 seat acoustical concert hall or even a rock club accommodating 3500 without having to accept any functional or acoustical compromises. www.logomo.fi*

Photo Joni Rantasalo

**Akukon** is a leading consultancy in acoustics and performance space design across Northern Europe and the Baltic countries. At Your disposal are over 50 designers and consultants. Our headquarters is located in Helsinki, Finland.

AKUKON

**Akukon Ltd** (Headquarters)
Hiomotie 19
FI-00380 HELSINKI, FINLAND
tel. + 358 10 3200 700
info@akukon.com, www.akukon.com

**Akukon Estonian Branch**
Tallinn
Tel +3726616900

**SIA Akukon-Būvakustika**
Riga, Latvia
Tel +37129407029

**Akukon Lietuva UAB**
Vilnius, Lithuania
Tel +37069923661

Dimbar76/Shutterstock

# Brake dancing

Moscow's Bolshoi Theatre features redundant braking systems designed to ensure safety without doubling braking torque

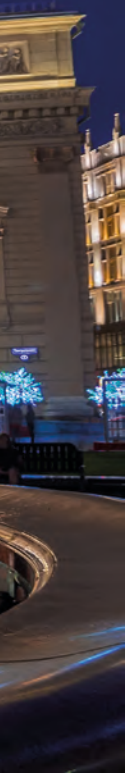
Above: **The Bolshoi Theatre uses ROBA quatrostop safety brakes from mayr**

The Bolshoi Theatre in Moscow is considered one of the largest and most important venues for opera and ballet in Russia, embodying Russian culture like no other playhouse. The Theatre, which was founded in 1776, employs approximately 900 people and provides space for around 1,800 guests. Several hundred scenery and point hoists are active behind the scenes, moving scenery, curtains and spotlights. They can lift and lower loads of up to a ton at a speed of up to 1.8m/s (5.9ft/s).

ROBA quatrostop safety brakes by mayr power transmission are used in the drives. These are tailored to the special requirements of the theater: to protect the stage construction in this historic building, brakes are required that work without doubling the braking torque in the case of an emergency stop, and which simultaneously provide maximum safety for both people and material. The compact ROBA quatrostop braking systems are redundant, but provide these capabilities, braking gently to prevent damage to components in an emergency stop.

The electromagnetic ROBA stop safety brakes work according to the fail-safe principle, meaning that they are closed in de-energized condition. They ensure reliable and safe stopping when the power is switched off, or in the case of a power failure or emergency stop. The braking torque is generated through the force stored in the thrust springs. If the magnetic coil is energized, a magnetic field builds up, attracting the armature disk against the force of the springs and thus releasing the rotor with the friction linings. The brake releases.

To protect those on the stage from falling loads, stage winches are generally equipped with two redundant brakes, which work independently from one another. Each of the brakes is able to hold the whole load safely alone. This guarantees that even if the brake fails, there is no risk for the actors below. If both brakes function, however, this approach causes the



doubling of the braking torque in emergency braking, and therefore places a substantial load on all the components.

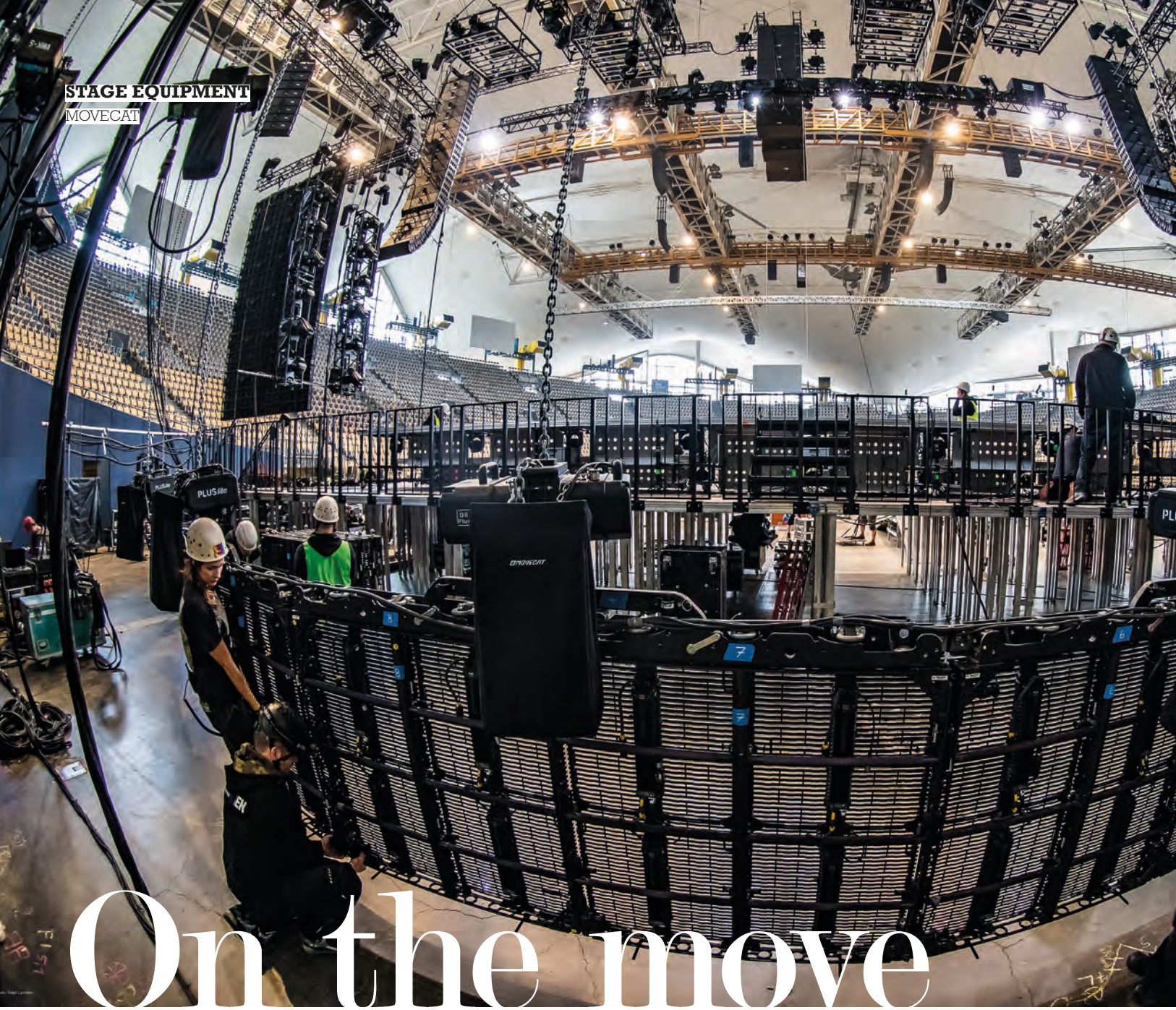
### Gentle on components

The ROBA quatrostop braking systems used at the Bolshoi Theatre have four individually switchable and inspectable brake circuits, each with a braking torque of 67Nm. Together, three of these brake circuits generate the required braking torque of 200Nm. The fourth brake circuit provides the required redundancy. This means that the braking torque for emergency braking actions is four times 67Nm, i.e. 268Nm. This is therefore only 33% higher than the required braking torque. In this application, classic dual-circuit brakes would have a braking torque of two times 200Nm, i.e. 400Nm – double the required braking torque. The ROBA quatrostop systems therefore brake gently and prevent damage to components. They also work extremely quietly and, with their short brake block, are particularly compact. ■

**www.mayr.com**

mayr power transmission

Left: **The ROBA quatrostop brake systems have four individually switchable and inspectable braking circuits, functioning without doubling the braking torque in an emergency stop**

# On the move

Kinetic stage equipment from Movecat was chosen for a recent tour by punk band Die Toten Hosen

Above: **Movecat's kinetic stage equipment, which is compliant with BGV C1 and SIL3 standards**
Opposite page: **Die Toten Hosen in concert**

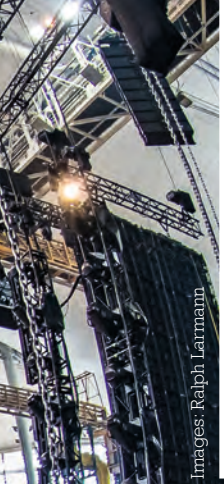
German punk band Die Toten Hosen visited major halls and arenas throughout Europe last year for its Laune der Natour 2017 tour. The lavish, 11-trailer tour was supported by equipment from Movecat, a specialist kinetic equipment company from Nufringen, Germany.

The technology used included D8 1 metric ton and 2 metric ton chain hoists, D8+ 0.5 metric ton and 1 metric ton chain hoists, as well as a larger number of the new VKM-S II 250 chain hoists. The single-fall VKM-S motors are designed to offer flexible handling and meet the highest safety standards. The control of the D8 and D8+ hoists is implemented using R-series RMC radio motion remote controls. These wireless remote controls operate in the 2.4GHz frequency band and, depending upon the model, are capable of controlling 4, 8 or 12 D8/D8+ motors.

## Complete control

An I-Motion Expert-T II system controller is used to control the VMK-S system. This controller makes it possible to manage complex kinetic applications with up to 240 drives, in a safe and user-friendly way, allowing D8, D8+ and C1 fixed- or variable-speed drives to be supervised and controlled intuitively.

The events technology engineer responsible for the kinetic equipment used on the tour, Jan Kleinenbrands of the R-Project Group,



Images: Ralph Larmann

offers an explanation for his decision to opt for the Movecat material: "Admittedly, the 1 metric ton D8+ motors are very large in terms of pack dimensions and their unladen weight is considerable, but due to their single chains they are far easier to work with. After careful consideration, we came to the conclusion that their advantages vis-à-vis conventional dual-fall 1 metric ton D8+ hoists outweighed any such drawbacks. It is a more expensive solution, because the material cannot be stacked in the trucks and more helpers are needed on-site, but the probability of errors is reduced considerably."

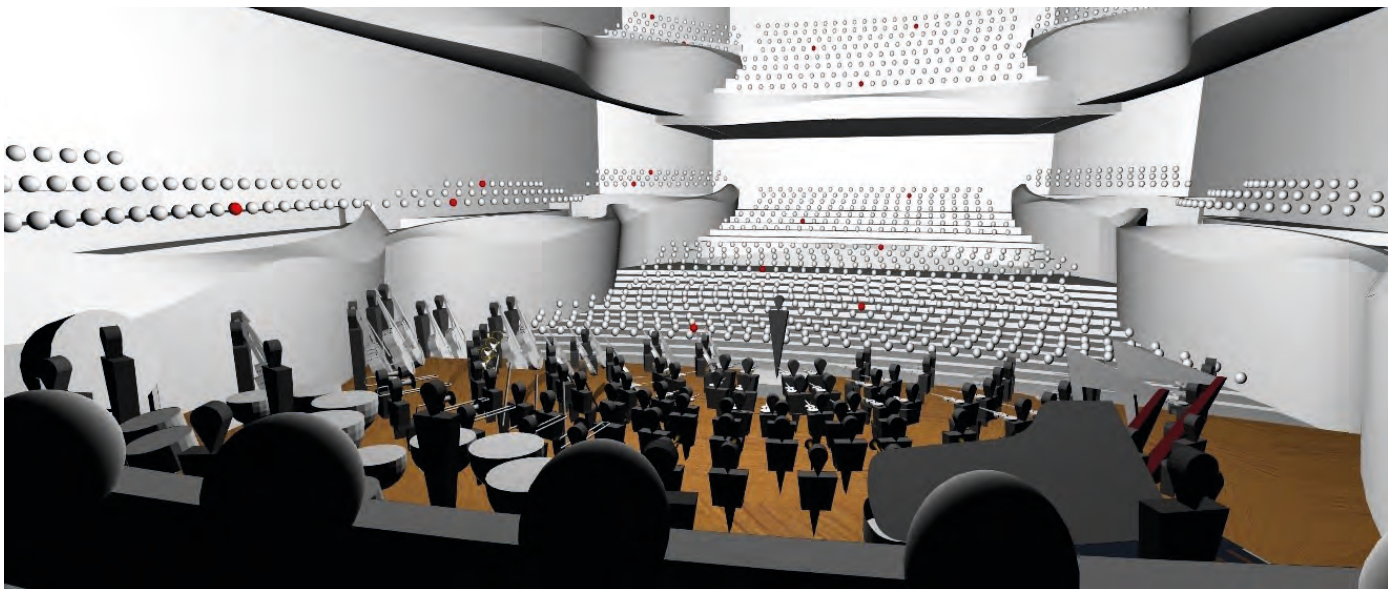
## Setting up safely

The I-Motion system is designed to offer optimized safety during setup as well as in operation. "The I-Motion is probably the best system controller around right now for touring applications," comments Kleinenbrands. "On this tour, we load the electronics onto a dolly specially designed by Lleyendecker to my specifications, so all that's left hanging in the rafters are the motors. This setup is extremely convenient from the standpoint of cabling, as well as being very easy to service. Furthermore, you can also suspend the VMK-S as a climbing hoist. That saves time and power in situations where high speeds are not called for."

In addition, the Movecat RMC-R radio controllers provide great visibility during lifting operations. "When rigging sound reinforcement equipment in particular, you can move right back for a better view without having endless lengths of cables in the load path next to the stage," explains Kleinenbrands.

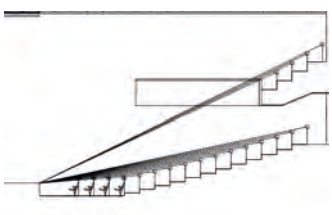
Movecat equipment's reliability, certification and handling were the reasons it was chosen by the Düsseldorf punk rockers. The Laune der Natour tour resumed in May 2018 as an open-air and festival tour. ■

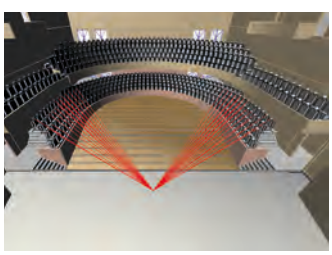
**www.movecat.de**

# Perfect vision

Performing arts and sports venues can use a new 3D modeling tool to assess sightlines in great detail





Top: **3D sightline analysis of a concert hall**
Above: **2D sightline analysis**
Below: **Problematic sightlines from a center front seat**

Undertaking sightline analysis of a performing arts or sports venue is a complex and at times highly subjective task. Historically theater designers undertook vertical sightline analysis in two dimensions using cross sections through the theater and tracing lines from the average eye location to the stage. The seating rake was determined for the first or second row for staggered seats based on the vertical distance between the eye and the top of the head.

Such studies were invariably limited to the view of a single point on the stage. However, sightlines are not experienced as a point and assessing the visual quality of a seat needs to take into account the view to the stage as a whole, and the patrons' relationship to the space and other people around them.

## 3D modeling

The development of three-dimensional computer modeling has enabled the view from each seat to be visualized using standard sized head and shoulder models. This is an improvement over using 2D vertical sections but assumes that there is only a single eye position in the center of the head – not taking into account the way audience members adjust their seating position to avoid their view being obscured by the person in front.

The existing approach to sightline analysis cannot provide theater designers and architects with sufficient information to determine whether the room will satisfy 50, 75, 95 or 100% of its patrons. The assessment is subjective, and what may be considered acceptable to the design team might be entirely unacceptable to a venue manager, particularly with regard to the venue's ticket pricing strategy.

## Objective measurement

To address the limitations of traditional sightline analysis methods, Marshall Day's 3D computer modeling team undertook fundamental research into sightlines, with the aim of developing an objective and quantifiable method for sightline analysis. The result of this work is a completely new way of analyzing sightlines for performing arts or sports venues.

The Sightline analysis system can be customized depending on the type of performance. There are standard defaults for orchestra, opera, drama and dance that take into account distance to the stage, viewed height

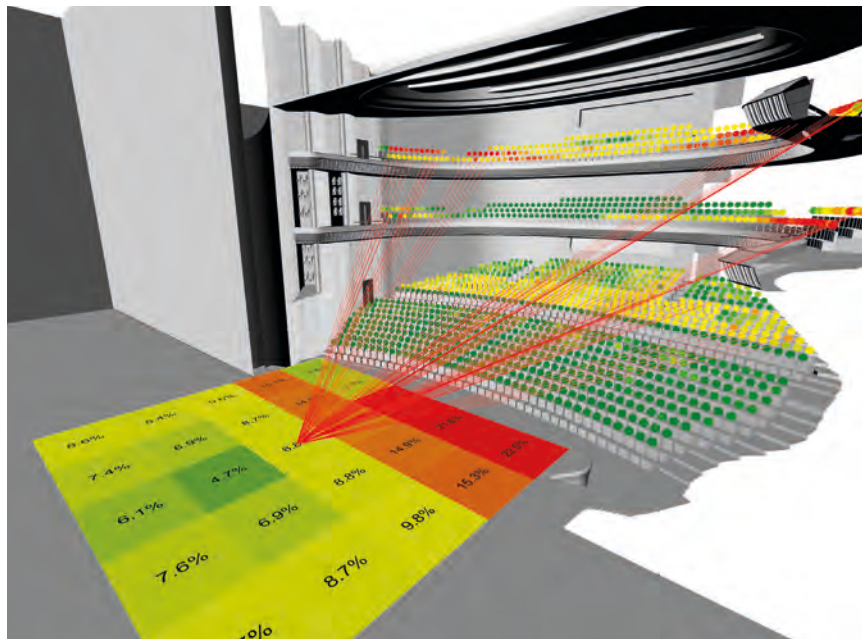
above stage, head movement away from center and vertical inclination – particularly useful when assessing the quality of view to screens and surtitles. The design team receives an analysis on how the sightline to each individual seat is obscured by physical barriers such as handrails, balustrades and other patrons. It highlights the zones that require further improvements in a clear and visual manner, but also details how many seats are affected.

The final assessment is run with a routine that takes into account vision with two eyes and the adjustment in head position made by audience members to naturally improve their view.

### Visual health

The system not only assesses the sightline from each seat numerically, but also provides a detailed analysis of the overall 'visual health' of the venue by providing a percentage view matrix of the stage.

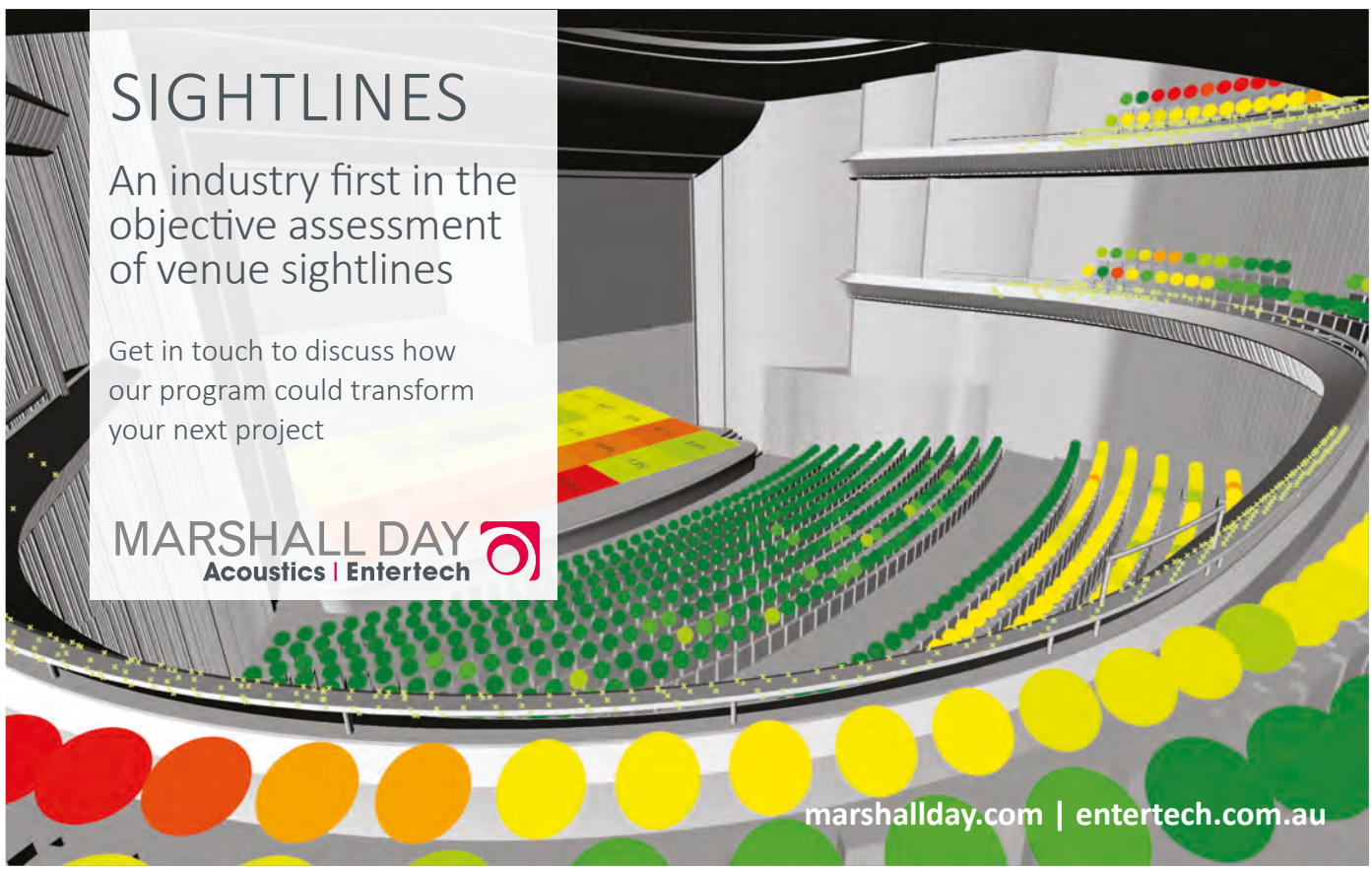
For the first time, sightline analysis can be linked to the stage layout, type of production, stage depth and stage set. And all this is quantified in terms of the percentage of seats in the house with compromised or no sightlines.




Above: **The grid indicates the percentage of seats with sightline problems for that section of the stage**

The Sightline system is ideal for concert halls and theaters, sports venues and stadiums, and convention centers and cinemas. ■

**www.entertech.com.au/Innovation/Sightlines**



# Rising star

A custom seating riser was installed at Mount Olivet Lutheran Church in Minneapolis to provide flexible, solid seating in a tight space

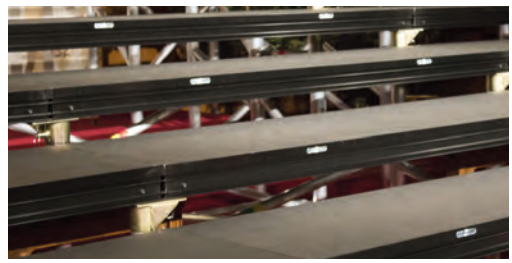
One of the world's leading designers and manufacturers of stage equipment for the performing arts and worship markets, Staging Concepts, continues to enhance the overall experience for both the audience and performers. Among the most adaptable tools to heighten these experiences are risers. Staging Concepts designs and manufactures seating and choral risers – all of which can be custom designed – to enhance venues of all sizes.

Seating risers are demountable and designed with versatility and ease of setup in mind. To accommodate a different setting or event, Staging Concepts' seating risers can easily be transformed into different configurations.

## Custom design

Mount Olivet Lutheran Church in Minneapolis, Minnesota, selected a custom seating riser system to replace a very outdated riser system used by its student choir. This system was made up of Staging Concepts' SC90 Platforms, SC9600 Bridge Supports, IBC Aluminum Guardrails and various accessories. The system itself was not the only custom requirement with this project – the layout in the church required a custom design because of the limited space. In the end, the seating riser system was designed to sit flush against the surrounding walls and existing communion rails.

Below: **The riser is installed flush against the church's walls and communion rails**



Above: **The new riser at Mount Olivet Lutheran Church can accommodate 200 choristers**
Top right: **Sturdiness was a key requirement**

"I'm amazed at how Staging Concepts' engineers did it," says Don Wamsley, facilities operations manager at Mount Olivet. "They designed a perfect riser specifically for our alter – and it's a limited space."

**Sturdy solution**

Mount Olivet's new choral riser replaced the then 40-year-old riser and can now safely hold more than 200 members at a time. "The riser is really sturdy and doesn't budge, so I'm not worried about it holding the kids," said Wamsley. Mount Olivet uses its custom seating solution all year round and even changes the configuration for smaller events.

Choral risers are another seating option provided by Staging Concepts. These versatile risers are compact and durable, making them ideal for choir concerts or performances at any venue. The casters make moving the SC Choral Riser easy; it can be done by just one person. When not in use, the SC Choral Riser can be folded up and stored, taking up minimal space.

All riser systems, portable stage equipment, guardrails and other products designed at Staging Concepts are built for long-term, repeated use. ■

**www.stagingconcepts.com**

# Index to advertisers


Tess Seymour

# Room at the inn

In the UK there is a long tradition of staging plays in drinking establishments. *Auditoria* raises a glass to three pub theaters providing a performance space on the fringe

## FINBOROUGH THEATRE, LONDON

This theater's long-standing artistic director, Neil McPherson – 19 years in charge and counting – is a bit of a hero on London's fringe scene. A vocal champion of new talent and a passionate protector of old, forgotten plays, he has always programmed this ramshackle room above a pub with a purpose. It's not his job, he insists, to echo the mainstream.

The theater that pre-empted the 1990s new writing boom is now more likely to produce the sort of play that has gathered dust on a shelf. But the Finborough hasn't turned its back on the new and, as costs rise elsewhere and opportunities dwindle, McPherson has made it his mission to give talent a chance – holding an annual festival of readings, Vibrant, to give new scripts a showcase.

Scott Rylander

Above: **A January 2018 performance of Christopher Chen's *Into The Numbers* at the Finborough Theatre**

## THE OTHER ROOM, CARDIFF

A long overdue addition to Cardiff's theater landscape, The Other Room was launched in 2014 with the express intention of kick-starting a fringe scene in the Welsh capital. Housed in the side room of Porter's pub, its 44-seat studio space gives independent and emerging artists room to experiment.

New artistic director Dan Jones is forging ahead, building links with the nearby Sherman Theatre and with Theatre Clywd, but The Other Room offers something different. The space is flexible enough to host rigorous realism end-on or turn itself inside-out for immersive experiences, making for a new sort of pub theater.

A dressing room, stage and seating fit into a space that is 10.3m (34ft) long and 5.6m (18ft) wide. In a typical end-on configuration the stage is approximately 3m (10ft) deep and the seating area is 4m (13ft) deep. But the space has been set up for pretty much every configuration, including traverse and promenade, with a comprehensive sound and lighting rig.

Above: **The entrance into The Other Room theater, a side room of the Porter's pub in Cardiff, Wales**

## GATE THEATRE, LONDON

Established over an Irish brewhouse in 1979 by American Lou Stein, and inspired by Greenwich Village's coffeehouse culture, The Gate marked the blooming of London's pub theater scene – the Bush, The Finborough and The Old Red Lion followed soon after. Each did its own thing, and the Gate's was internationalism.

The Gate remains committed to work from overseas – a mission for which it gets regular funding. The pub below changes hands often, but The Gate has all but cut ties and taken its future in hand.

CINCINNATI MUSIC HALL
SPRINGER AUDITORIUM
CINCINNATI, OH

MARTINEZ+JOHNSON
ARCHITECTURE
WASHINGTON, DC | NEW YORK, NY

THEATRE PLANNERS / LIGHTING DESIGNERS
Schuler Shook

# Beyond imagination

Finding the right balance between safe and reliable stage automation and related investments during the entire lifecycle of your machinery: that is what Rexroth aims for. Together with you, we increase the efficiency and availability of your upper and lower stage systems, and find the best solution for all moving parts: on, above and below your stage, and even at other locations in your theatre or facilities. Our project specialists will advise you on all possibilities, beyond your imagination.

**WE MOVE. YOU WIN.**

rexroth
A Bosch Company

www.boschrexroth.com/stage