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# Auditoria

Annual 2010

Also inside:

**Genexis Theatre, Singapore**

**Grand Canal Theatre, Dublin**

**Alternative Spaces: New Audiences**

**New US PACs**

## Raising the Bard

Royal Shakespeare Company unveils  
revamped Stratford-upon-Avon theatre





# PROLYTE GROUP

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## DeLaMar theatre opens doors in November

After a complete renovation, the DeLaMar Theatre, formerly called Nieuwe de la Mar, opens on November 28 with 2 new spectacular performances.

The programming of the DeLaMar will focus on high-quality theatre productions, a continuation as well as a tribute to the theatres former legacy.

In order to facilitate these productions, the DeLaMar will have two fully equipped theatres, summing up to a total of 1500 seats. The main theatre (939 seats) will premiere with the musical La Cage aux Folles; the smaller theatre will start with the play Infidelity, based on Ingmar Bergman's movie Faithless. The DeLaMar theatre will feature no less then 12 premieres this season.

The VandenEnde foundation, owned by Joop en Janine van den Ende, funded the renovation, an investment of over 65 million euro. The building, lobby and lounges were restored in a unique way, making a tribute to the theatres old luster. Furthermore the theatre is outfitted with high-end technical equipment. Jo Coenen and Arno Meijs designed the new building, which partly rises behind the old façade.

Prolyte Theatre Products alliance partner STS, a regular supplier for the VandenEnde Musicals, was asked to design and supply the complete stage automation system. The fact that STS could supply the complete installation, from winches, to software to steel works, gave them a vanguard position.

By using very compact winches for the fly wall automation there was no need to invest in an expensive fleet angle correction mechanism. The specifications on the fly wall system are (per fly bar):

5 cables	Lifting height 14,6 m.
Loading capacity 500 kg	Lifting speed 1,8 m/sec
Point load 250 kg	Max. Acceleration 3,33 m/s <sup>2</sup>

Based on their huge experience with touring and temporary installations, STS designed a new control desk, the Composer desk to control all stage automation. Safety, user friendliness and easy of operation lay at the base of this desks development.

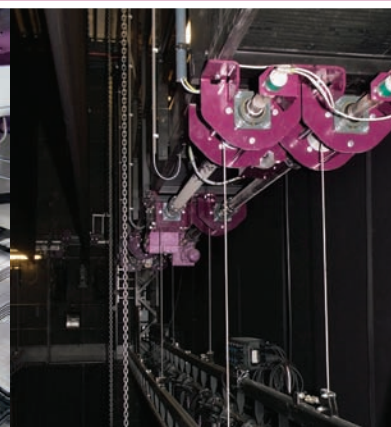
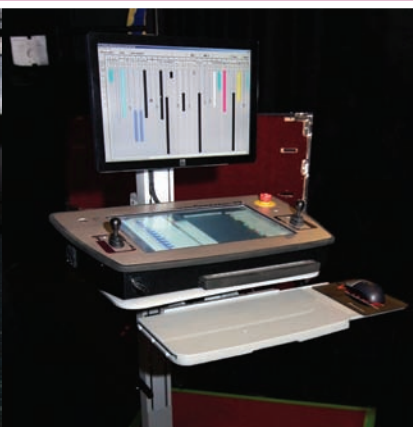
The narrow accuracy of +/- 1 mm on the drum, combined with automation of other elements, like stairs, tracks and stage wagons, creates optimum synchronisation and thereby safety.

The whole installed system complies with BGVC1, DIN 56950 and IEC61508 SIL3 regulations and requirements.

Installed equipment Main Theatre:

Front curtain installation; Greek and Wagner, Scrim Drop, Moving lighting bridge, 2 sliding vertical tormentors, 40 power fly winches of 500 kg and 0-1,8 m/s, 6 line shaft winches, 2 side line shaft winches, 1 grid iron and winch foundations, 6 Point hoist winches 250 kg 0-2 m/s, 4 stage chain hoists, 6 chain hoists for the proscenium, 6 auditorium chain hoist including rail tracks and traverses, 2 proscenium light lifts, 1 proscenium bridge, 2 auditorium bridges, Fall security system on all bridges.

The installation in the DeLaMar theatre is a good showcase of the capabilities of Prolyte and STS. Prolyte Theatre Products and STS have engaged in an alliance to promote and distribute a complete range of winches and theatre equipment, controls and desks. Using their combined experience and expertise and adding the Prolyte Group distribution network, they are able to support consultants and offer service and backup on a global scale.





## From the Editor

Welcome to the 2010 *Auditoria Annual*, which continues to provide venue owners and operators worldwide with a unique source of information on everything from architecture, acoustics, lighting and seating through to stage systems, theatre planning and ticketing. We also continue to take a look at some of the most innovative and exciting venues out there – including the newly renovated (late November 2010) Royal Shakespeare Theatre in Stratford-upon-Avon and home, of course, to the Royal Shakespeare Company. A £113 million upgrade sees the introduction of a more intimate 1,040-seat auditorium with audience members never further than 15m from the new thrust stage. Readers will also find reports on Dublin's 2,100-seat Grand Canal Theatre, designed by Daniel Libeskind, which opened in March 2010; Singapore's fascinating Genexis Theatre, part of the city's Fusionopolis research and development park; and a summary of new US performing arts centres set to open in 2011.

We also take an exclusive look at how a new generation of British artists and production companies are seeking out unconventional venues away from traditional theatres to engage with new audiences. This includes the Royal Court Theatre, based in London's exclusive Sloane Square, hiring a retail unit in the rather less salubrious surroundings of the Elephant & Castle shopping centre in south London to stage productions; and the Old Vic running plays in a set of tunnels underneath Waterloo station.

Perhaps the artform in most need of such invention is opera – hence the English National Opera's (ENO) recent collaboration with Punchdrunk to stage a new opera based on *The Duchess of Malfi* in a Docklands office block – the ENO usually stages its productions at the London Coliseum. Punchdrunk's productions are designed and written for the spaces in which they are performed and feature a mix of visual arts, movement, theatre and music, through which each member of the audience finds his or her own path and constructs their own unique perspective on the show. The strategy seems to be paying off: "The audience for opera has to grow and become wider," says the ENO's artistic director, John Berry. "Of our audience, 30% is under 44, up 10% in the last couple of seasons and for contemporary work it's much younger."

This spirit of collaboration will be key going forward – with cuts to arts funding expected across the board, venue owners and operators are going to have to get together with artists and producers to think hard about how best to utilise their combined talents. Highly flexible venues capable of housing a wide range of performance will have a clear advantage – we hope the insights provided within these pages will help ensure a healthy, prosperous and bright future for one and all.

Anthony James,  
Editor

Peter Cook

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Peter Cook

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## Credits

**Architect:** Zaha Hadid Architects

**Design team:** Melodie Leung, Gerhild Orthacker

**Acoustic consultant:** Sandy Brown Associates

**Tensile structural engineer:** Tony Hogg Design

**Fabricator:** Base Structures

**Fabric:** Trapeze Plus Lycra

**Lighting:** DBN Lighting





# Auditoria loves...

...the JS Bach/Zaha Hadid Architects Chamber Music Hall

**T**he hall was specially designed by Zaha Hadid Architects for intimate solo performances of Johann Sebastian Bach's music. Pivotal to its function is a ribbon that swirls within the room, carving out a spatial and visual response to Bach's intricate harmonies. "The design enhances the multiplicity of Bach's work through a coherent integration of formal and structural logic," says Hadid. "A single continuous ribbon of fabric swirls around itself, creating layered spaces to cocoon the performers and audience within an intimate fluid space."

As well as spatially defining a stage, an intimate enclosure and passageways, the ribbon was designed to enhance the acoustic experience of the concert. Mark Howarth, partner at Sandy Brown Associates, acoustician on the project, says the designers looked at achieving a reverberation time of 1.4-1.7 seconds at mid-frequencies (500-1,000Hz) with a higher reverberation at lower (bass) frequencies to provide a warm room response.

The ribbon consists of a lightweight synthetic fabric (150g/m<sup>2</sup>) supported on a rigid steel framework suspended from the ceiling to provide the flowing shape of the installation while minimising absorption. "The shape of the frame and fabric acts to scatter sound

reflections between parallel walls within the gallery to eliminate flutter echoes and provide a more even diffuse sound for audience members," Howarth says.

Around the stage, specially shaped acrylic reflector panels have been carefully positioned and hidden within the fabric of the installation. "These are designed to reflect sound with a short delay back towards the performer and out towards the audience to increase the clarity and strength of the music while maintaining the reverberant response of the room," says Howarth.

Another reason to admire the hall is that it can be transported and reinstalled in various venues. It was first installed at the 2009 Manchester International Festival, in a 420m<sup>2</sup> space (with a 6m height) at Manchester Art Gallery. It took four weeks to install and was in place for two months (3 July – 31 August 2009). As well as the 110m-long, 1,600kg ribbon, the installation included acrylic acoustic panels, pantone chairs, a rubber floor with vinyl graphic and steel and painted plywood stage. Then in 2010, the design travelled to the Holland Festival in Amsterdam, where it was installed in a 2,625m<sup>2</sup> area (with a 14m height) at a gas factory. Installation in Amsterdam took nine days, and the exhibition was held over two-and-a-half weeks (5-23 June 2010).



ISPA  
ANTHONY JAMES

# Face value

George Packer, Zarin Mehta, Katrin  
Macmillan and Tim Robbins (left to right)  
on stage at the 2009 ISPA Annual Congress



David Baile, CEO of the International Society for the Performing Arts, says internet social networking sites are no substitute for the benefits of face-to-face meetings

### **What is ISPA?**

The International Society for the Performing Arts (ISPA) is a not-for-profit international network of performing arts professionals that strives to provide the best possible support, information and opportunities for collegial exchange to its members throughout the world. We focus on building leadership ability, recognising and discussing industry trends and providing a forum for the global exchange of ideas and information. We offer professional development programmes, resource sharing, online exchange and a programme of annual international congress meetings.

### **How many members do you have and what does it cost?**

ISPA is a network of over 350 individuals, organisations and institutions from more than 50 countries around the world, including China, United Arab Emirates, South Africa, and India. Members include some of the world's most significant presenting organisations, independent artists, performing arts organisations, artist managers, cultural policy groups, foundations, consultants, and many others who share the desire to advance the field of the performing arts on a global scale. Some of our newest members include the artistic director of the National Cultural Centre in Taipei, Taiwan; the general manager of the Dubai Community Theatre and Arts Centre; and the Bogota Orchestra, Columbia.

Membership rates are applied according to the size of an organisation with individual members assessed differently. Membership includes access to the membership database – that's the primary reason people join – to be part of that network.

### **Why not just make the same connections using the internet – for free?**

Like everyone else, ISPA is keen to take advantage of social media – we've got a Facebook page, we've just started on LinkedIn and we've

started doing stuff with Twitter, which is all really useful. In particular, I see it as an opportunity to broaden our reach with the general public – for example on our Facebook page

more than half the people who have 'liked' us or have become fans aren't actually ISPA members. However, ultimately I feel people want to come together. The biggest membership benefit of ISPA involves face-to-face exchange. In particular the rewards of attending one of our annual congresses cannot be replicated on the internet.

### **What can visitors expect from ISPA's Annual Congress?**

ISPA's 63<sup>rd</sup> Annual Congress will be held 11-13 January 2011 in New York, USA. Over the course of three days a range of experts from a variety of fields will explore the nature of collaborations including best practices and new opportunities. Highlights include the 'New Works Now' session, which provides an excellent opportunity to become involved in commissioning and/or presenting new works before they fully enter the international marketplace. There are also many opportunities for casual networking, establishing new contacts, and maintaining existing relationships, including an awards dinner and dance.

We're also trying to move away from the traditional conference approach – we're moving more towards smaller, more focused sessions and we're trying new formats, including debates and interviews to facilitate a real exchange between the delegates and speakers. Ruth McKenzie of the London 2012 Cultural Olympiad is a key speaker and we are expecting about 300 delegates in total. ■



**David Baile**





ROYAL SHAKESPEARE THEATRE

EMMA POMFRET

# Raising the Bar

The newly refurbished and redesigned Royal Shakespeare Theatre in Stratford-upon-Avon has finally opened its doors to the public, preserving the RSC's heritage in a state-of-the-art building

Peter Cook





**The new RST auditorium  
features a thrust stage and  
just over 1,000 seats**



Shakespeare's lines from *Twelfth Night* are projected onto the wall of the brand-new, £112.8 million Royal Shakespeare Theatre (RST) in Stratford-upon-Avon, UK: "Be not afraid of greatness. Some are born great, some achieve greatness and some have greatness thrust upon them."

Though Shakespeare couldn't have known, his lines speak volumes about the RST's transformation. History runs through this project as if it was a stick of rock, and the team had constraints thrust upon them: physical, artistic and financial. But these constraints are what produced the greatness of the new theatre design.

Modernisation was desperately needed, as anyone who has visited or acted in Elisabeth Scott's 1932, cinema-inspired, fan-shaped Grade II listed Art Deco theatre will tell you. Inside Scott's auditorium, the furthest seat was marooned high up in the balcony, 27m from the stage.

"It was like trying to act from Dover to Calais," says Sir Christopher Bland, chairman of the Royal Shakespeare Company's (RSC) board. Meanwhile, the red brick exterior presented a closed-off, foreboding face to visitors and Stratford-upon-Avon residents.

Opening on schedule after three and a half years' construction masterminded by Mace, the new design, by architect Bennetts Associates and theatre consultant Charcoalblue, addresses all these points. It provides a thrust stage, intimate one-room auditorium for more than 1,040 seats and brings the audience closer to the stage. It improves the public spaces, changes Stratford-upon-Avon's perception of its artistic jewel and tourist draw (the RSC contributes about £58 million annually to the West Midlands economy) and preserves RSC heritage in a state-of-the-art building.

### The sticking place

The RST has always been an evolving theatre and Michael Boyd, artistic director, and Vikki Heywood, executive director, did not want to tear down Scott's building. "We had two 1932 bookends: Elisabeth Scott's Art Deco foyer at one end; the fly tower at the other end," explains

Andy Hayles, managing director of Charcoalblue. "They were our Checkpoint Charlies; we didn't cross those lines."

"These constraints of the building have created very dramatic spaces," adds Simon Erridge, director of Bennetts Associates. A triple-height void now rises between the drum wall of the new auditorium and the preserved outer walls of Scott's auditorium. It acts as an orientation clue for the audience, walking below to find their seats, and as a visual ghost of Scott's theatre. The heritage wall is scarred with deep balcony marks, niches and stairs.

"The scarred wall embodies our desire to marry the new and the old," explains Boyd. "We didn't want to lose the patina of the old next to the very bold gesture of the curved drum wall of the auditorium."

### All the world's a stage

The heart of the transformation is the new RST auditorium, built around a thrust stage in a style that Boyd hopes Shakespeare would recognise: democratic, intimate and immediate.

"We wanted a one-room space rather than having lots of people sitting in the dark looking at lots of other people in another room through a nice, big square hole," he says.

The distance from actor to the furthest seat has been almost halved, to only 15m, and sightlines – often a problem in multidirectional thrust stages – are impeccable.

There are fewer seats – just over 1,000 to Scott's 1,400 – but as Hayles points out, "If 300 seats are not great – like those at the back of Scott's upper circle – and your first experience of Shakespeare is from 27m away, are you going to come back for more? Michael and Vikki's vision was that this should be the world's best house for playing Shakespeare."

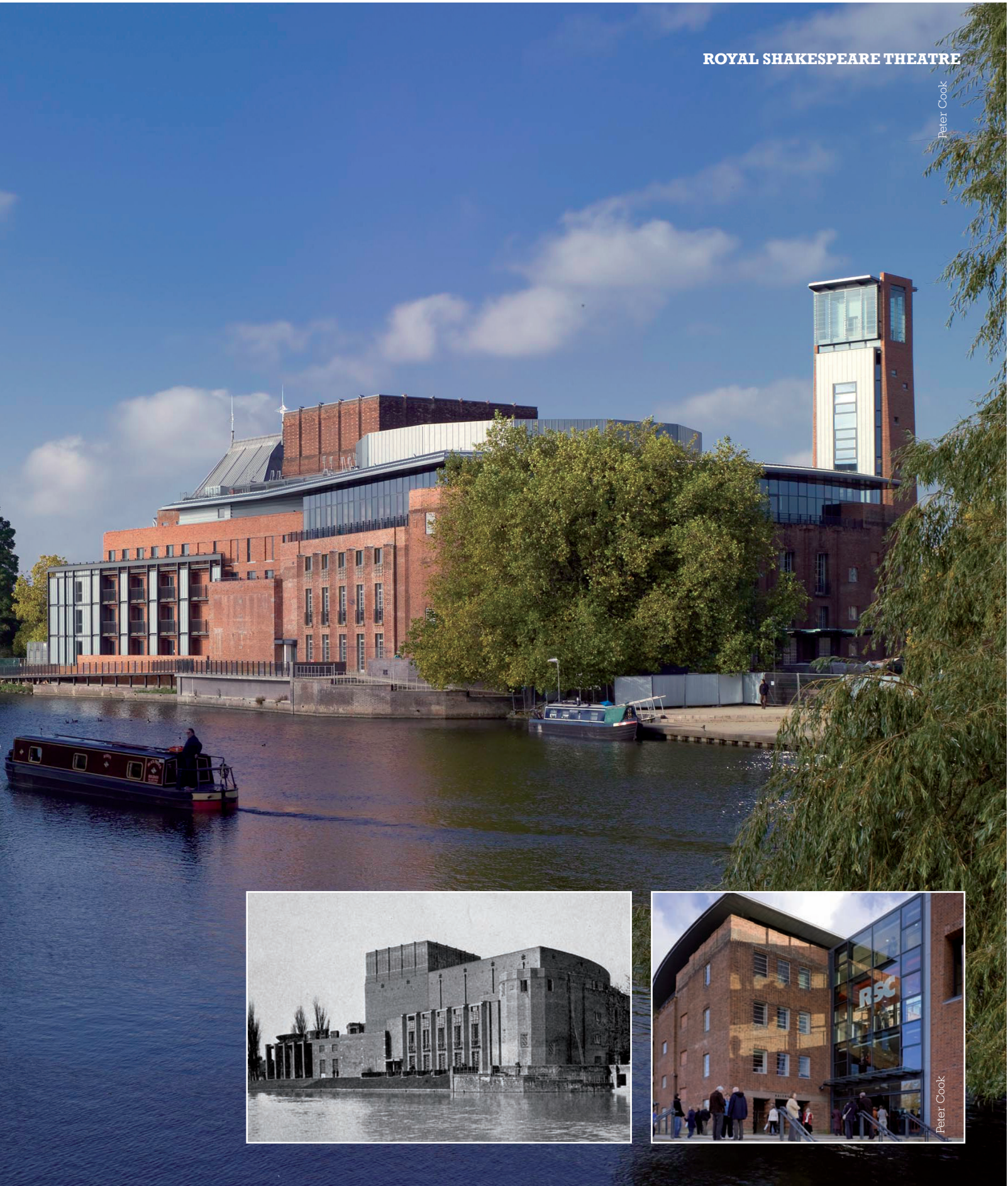
In effect, the RSC was able to trial the thrust idea in the Courtyard Theatre, its temporary home since 2006. Bennetts and Charcoalblue have improved on this 'prototype'; the new RST has better sightlines, more flying-in space and is more intimate.

To answer Boyd's desire for 3D staging, Buro Happold, consulting engineers, pulled off an incredible feat. Under the stage, in what Rab Bennetts, founder of Bennetts Associates,



The new face of the RST (main image and inset far right); how it looked in 1932 (inset right)







Ellie Kurtz/RSC



affectionately terms “hell”, is a 7m-deep basement, dug into the flood plain of the River Avon using concrete base slab and walls of interlocking piles to withstand a massive 750 tonnes of uplift from ground water. This was the biggest engineering challenge of the project, connecting to the old theatre’s 10m basement.

The substage areas are also flexible. Spanning beams can come out to drop the main stage down a level; the modular stage floor can be removed to create a double height basement to fly things up – or simply to provide a dramatic entry point for a Roman army.

Where there’s a hell there is a heaven – a double-stacked technical area above stage, with a 15m flying-in zone and access to dual drum point hoists and the lighting rigs. Here is an RSC first: 30 lighting clusters are fitted with a patented Lightlock designed by the RSC’s head of lighting, Vince Herbert. The gyroscope-like invention stops the rotational swing of moving lights in less

than a second. “I hope we’re going to make some money out of it,” says Boyd. “We’ve already taken one order from Lady Gaga.”

In terms of artistic flexibility, the thrust stage can be widened, trimmed or seats can be carried around to play a season in the round. Incredibly, should a director wish to return to a proscenium stage, they can. “Everything is bolted together and everything is retained in the old fly tower so that, if we need to, we can go back to a pros house,” explains Gavin Owen, senior consultant at Charcoalblue. With a smile, he adds, “But it’s not a light undertaking.”

The audience enters the auditorium through a curtain, welcomed into a room of maroon seats and dark wood. Textures are rich and robust; the back wall is sawn oak; the steel is left bare. “That’s deliberate,” says Erridge, “because in a thrust, the auditorium is in the play; those textural materials are a basis for layers of theatre design.”

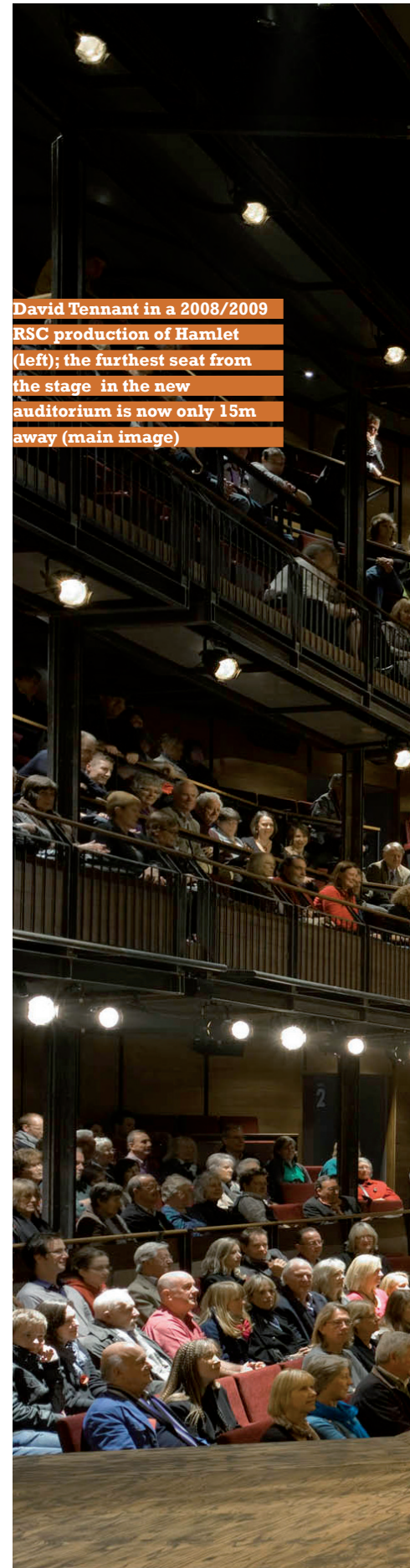
The auditorium also offers more acoustic bounce back, which was achieved, with Acoustic Dimensions’ input, by incorporating a reverb stalls railing, the minute adjustment of seat rakings, inclined walls and absorptive surfaces above the lighting rigs. Any sound that floats above does not return as an echo.

## Neither a borrower nor a lender be

What strikes a visitor now is the airiness and natural flow through the public spaces, inside and out. Gone is the clutter of crammed-in bars, shops and information points, replaced by a street-facing shop, four bars and a new Rooftop Restaurant. “We’re targeting to bring in more than £1 million a year turnover from our catering, and that will build,” promises Heywood. In 2011, the RSC’s 50th anniversary season, it faces a 7% budget cut, equivalent to £1 million (following the UK government’s spending review). “So we need to punch our weight like other national organisations,” says Heywood.

Revenue drivers and public footfall are vital. “We said to Bennetts we wanted to make this a building that could welcome people on all four sides,” says Heywood. Bennetts duly provided four entry points to suck in visitors: the riverside terrace and café, which punctuates a new, step-free riverside walkway from the town to the Holy Trinity Church (Shakespeare’s burial

David Tennant in a 2008/2009 RSC production of Hamlet (left); the furthest seat from the stage in the new auditorium is now only 15m away (main image)



## MEASURE FOR MEASURE

- 11,000m<sup>2</sup> – area of RST/Swan Theatre
- 1,046 seats
- 24 different types of seat
- 22 seats fold into the floor for disabled access
- 7.2m wide x 10.25m deep stage
- 15m high flying zone
- 100-tonne steelwork in stage structural frame
- 10 tonnes load of scenic lift; moves at 2m/second
- 150 modular panels in stage floor
- 2.5° acoustic tilt to side walls
- 10 rep shows can be stored in RSC’s old fly tower and basement and RST’s new basement and fly tower
- 15 new dressing rooms, with balconies and River Avon views
- 100% low energy light bulbs in public and backstage areas
- 4 bars; one Riverside Café; 150 covers in new Rooftop Restaurant
- 47 ladies toilets; 7 gents; 24 urinals



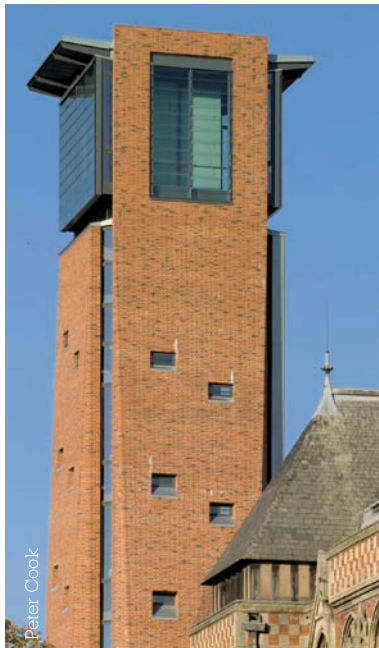


Peter Cook





Peter Cook



Peter Cook

**The new Rooftop Restaurant (top); the tower (above)**

place); Bancroft Gardens (restored by Stratford Council); a new, waterside Weston Square; and two new theatre entrances on the Colonnade.

This new space not only connects the Royal Shakespeare and Swan theatres for the first time, but also provides views through the building from Bancroft Gardens to Holy Trinity Church. Bennetts has connected the RST to its environment and neighbours, most evidently where the Colonnade houses the theatre's 'get in' or dock.

"A fundamental problem with this building is there isn't actually a backdoor for loading scenery," says Simon Harper, RSC deputy project director. "We had to make a decision which part of the building we would compromise."

An enormous metal door is on one wall of the foyer; when it opens to allow in scenery, people outside will be able to see through to the stage. Leicester's Curve was criticised for demystifying theatre with an equally public scenery 'get in', but consultations with the Stratford community (masterminded by Mace) revealed that people wanted the new RST building to "reflect the magic that happens inside it".

Perhaps the biggest 'welcome' is the RST's new 36m-high tower. It is brick-built around

a lift, which whizzes visitors to the viewing platform above. On a clear day, people can gaze across four counties; on any day they can see Shakespeare's birthplace, the Bard's school, the church where he was married and buried, and the site where – returning to Stratford wealthy and retired – he bought his last house.

### **Tower of strength**

"As an introduction to Shakespeare, the tower has the quality of a kind of fly paper," says Bennetts. "People are attracted to the building." Simon Erridge adds, "It pulls people up to look at the view, it educates about Shakespeare in Stratford-upon-Avon, and it drops people back in the heart of the building at the bottom."

The tower also has a built-in Juliet balcony, which looks over the new Weston Square, where Boyd hopes to create a natural amphitheatre for summer performances. Besides the prototype Courtyard Theatre, the new RST owes much to the intimate 400-seat Swan Theatre, opened in 1986. Michael Reardon's design has been refurbished and tweaked, while preserving its much-loved identity.

"The Swan wasn't really broken, so we haven't really fixed it," says Boyd. There have been improvements, however. Changing the air-conditioning system freed up the roof space to enable flying-in, the basement has been opened up for scenery storage, and a new scene dock and goods lift make show turnarounds more efficient.

Bennetts and Charcoalblue's transformation of the RST has achieved the contradictory; a marriage of old and new, epic and intimate, statement architecture yet welcoming building. In the Rooftop Restaurant, where tables are set around the new auditorium's drum wall, three of the old upper circle seats are mounted high up on the wall. They mark the furthest point from the stage in Elisabeth Scott's 1932 auditorium. They also mark how far the RST has come with a performance venue for tomorrow, which nevertheless places heritage centre stage. ■

### **Author**

**Emma Pomfret** is a regular contributor on the arts for *The Times*, *The Guardian* and industry titles including *Opera Now*

## **ALL'S WELL THAT ENDS WELL**

- Original 1932 teak stage boards relaid in foyer
- Art Deco upper circle bar restored
- 1932 ashtrays recycled as lights in Scott Bar
- 5,000 bricks reclaimed for RST restoration
- Scott Bar original aluminium and copper doors restored
- 1932 box office front in Scott Bar; 'flying box office' moves on tracks up the wall during intervals to create space
- Steel trusses from old roof recycled for benches on Weston Square
- 1930s pipework retained for heating and ventilation
- Crittall Windows, original 1932 company, commissioned to make new doors and windows for Riverside façade
- 182,000 bricks hand-thrown in Forest of Dean
- 50 'My RSC' boxes of miniature artworks by staff, public and RST alumni built into RST walls



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**NEW AUDIENCES**  
STUART WATSON

**Punchdrunk and The Old Vic  
collaborated for *Tunnel 228*,  
the first of a series of shows  
staged in tunnels beneath  
London's Waterloo Station**





# Outside influence

Artists and producers in the UK are forsaking traditional venues in an attempt to engage with new audiences

**T**he 2000s were the decade of site-specific and immersive theatre, with artists exchanging the constraints of traditional theatre venues for abandoned warehouses and railway tunnels to bring live performance to a generation unaccustomed to sitting passively in their seats.

Over the past few years big mainstream producing theatres in the UK have also begun to utilise new and radical spaces in order to broaden their audience, and despite the technical difficulties involved, even opera and dance have begun to take up the challenge. Meanwhile the UK's National Theatre has expanded the concept of reaching out to new audiences beyond traditional theatre walls a step further – broadcasting live performances to cinema screens via satellite link (see sidebar).

However, such ventures are not for the faint-hearted. They can be expensive and difficult to manage, while the number and breadth of the audience can be difficult to quantify.

## Roll with the punches

Punchdrunk, founded in 2000 by artistic director Felix Barrett while studying at the UK's Exeter University, is credited with galvanising the site-specific and immersive theatre movement. In past productions the company has transformed a derelict warehouse in Deptford, London, into a dark vision of Prospero's island in *The Tempest*; a

former archive building in London's Docklands into Heaven and Hell for *Faust*; and for the Manchester International Festival in 2009 Punchdrunk created *It Felt Like a Kiss*, in which the audience was chased through a disused office building by a chainsaw-wielding maniac.

The company has also undertaken collaborations with high-profile performing venues, creating a theatrical art installation for London's Old Vic in *Tunnel 228*, and working together with the English National Opera (ENO) to stage a new opera based on *The Duchess of Malfi* in a Docklands office block.

Punchdrunk's productions are all designed and written for the spaces in which they are performed and feature a mix of visual arts, movement, theatre and music, through which each member of the audience finds his or her own path and constructs their own unique perspective on the show.

Colin Nightingale, a former DJ who joined Punchdrunk in 2003 and is now a senior producer, warns that it is takes lot of work to make a site ready for public performances. Typically each Punchdrunk show is six months in gestation and involves setting up a completely new venue. The building for *The Duchess of Malfi* was covered with windows, which all had to be blacked out, and the venue for *Tunnel 228* had no power supply or lighting.

Then there is the task of finding a suitable building: *The Duchess of Malfi* was originally



## NEW AUDIENCES



Stephen Cummiskey

**Punchdrunk and the ENO staged *The Duchess of Malfi* in an office block (above); while shows held in The Old Vic Tunnels include *Platform*, which starred more than 100 local volunteers (right)**

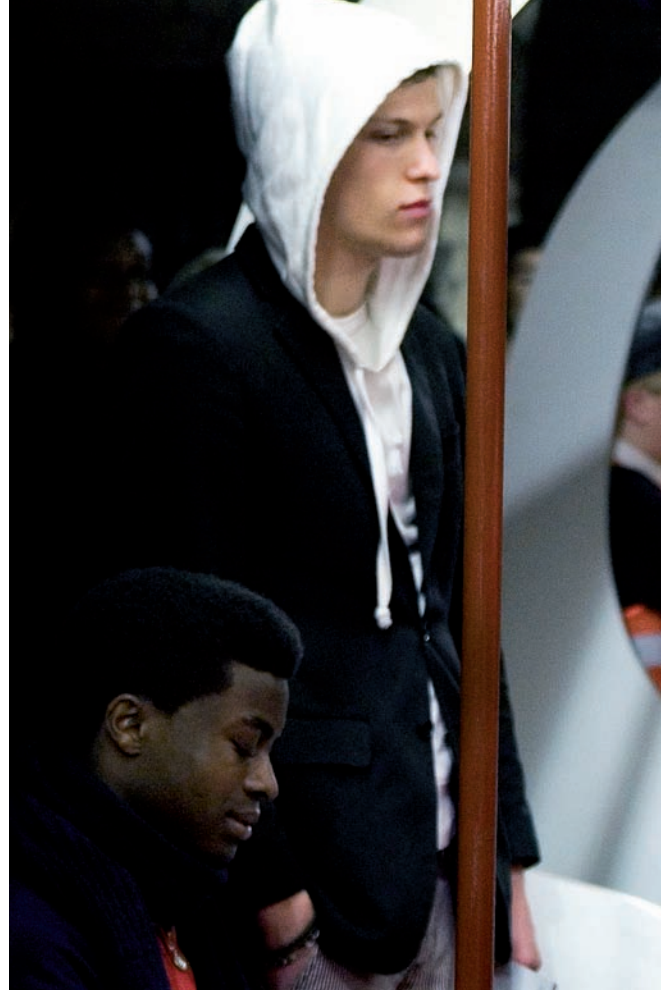
going to be staged at a completely different location (in Euston) until a change of ownership prompted the scrapping of that particular plan. A frantic search followed and the production was barely a month away from being abandoned before the right venue was found.

Setting up and operating innovative venues can be expensive too. Performance collective Shunt, which also creates immersive productions, was forced to vacate its home in the tunnels under London Bridge station due to redevelopment plans. After a long search the company hired a warehouse in Southwark for its next project, *Money*. Taking its inspiration from the banking crisis, the production was set within an immense walk-in machine of Victorian appearance that Shunt built within the space.

Shunt founder member Lizzie Clachlan reveals that despite a long sell-out run the production has nearly bankrupted the company; although she can still take pleasure in the irony of the situation: "Our journey has mirrored the financial crash," she says.

### Self empowerment

The pay-off for these difficulties is the ability to reach beyond a traditional theatre audience and to shape their experience in a way that is difficult for conventional venues: "Our audience



demographic is really broad. It's not unusual to have a group of 16-17 year olds on a school trip and an open-minded 80 year old. There are people who wouldn't go and sit down in a theatre," declares Nightingale. "The way people learn and get access to information is changing. This generation has grown up using the internet and interacting with their TVs. They are a lot more empowered about how to entertain themselves. We give them the power to take their own decisions."

When the ENO approached Punchdrunk about a collaborative project, its artistic director John Berry had his eye on attracting a new audience. The ENO has made a concerted effort to do so in recent years and this season's programme includes productions involving physical theatre troupe Complicite and former 'Python' Terry Gilliam. "The audience for opera has to grow and become wider," says Berry. "Of our audience, 30% is under 44, up 10% in the last couple of seasons and for contemporary work it's much younger."

Berry adds that the audience for *The Duchess of Malfi* was completely different from the usual ENO attendance, although he admits that he has no idea whether they will return to watch more conventional works at the company's home, the London Coliseum.





## National Theatre Live

On 25 June 2009, and throughout the month of July, the UK's National Theatre (NT) broadcast a production of *Phèdre*, starring Helen Mirren, live via satellite to 50,000 people in 280 cinemas and arts centres around the world. It was the beginning of National Theatre Live, a project which has subsequently brought five more NT productions to a network of screens which has now grown in number to around 350, chiefly in the UK, USA, Australia, New Zealand and northern Europe.

NT artistic director Sir Nicholas Hytner has said that the idea was "shamelessly ripped off" from the Metropolitan Opera House in New York, USA, which has been operating a similar scheme for several years. However, it was the first time that it had been tried for "straight" theatre.

Head of digital media, David Sabel, says that as a publicly funded institution the NT's aim is to bring productions to a wider audience than is possible through traditional touring. He adds that broadcasting live was always an essential element of the plan: "That creates a sense of event, so that the cinema space is transformed into a theatre where you get the best seats in the house for £10."

Box office takings are split with the cinema operators. The first season was loss-making and made possible by sponsorship from pension fund Aviva, but Sabel says the business plan is for NT Live to become self sustaining, "eventually".

A report from the National Endowment for Science, Technology and the Arts (NESTA) has suggested that NT Live audiences are more likely to attend performances at the NT and regional theatres as a result of seeing the broadcasts. The next season of NT Live will include the Donmar Warehouse Theatre's production of *King Lear*, and Sabel hopes to programme eight to ten events a year, including two or three collaborations. "We want to be the network for British theatre," he says.



ntlive





Johan Persson

**The Royal Court Theatre hoped to create a 'less-intimidating' venue in the Elephant & Castle shopping centre (above); and the English National Ballet has performed in a portable 'bubble' (right)**

### Going underground

The Old Vic is another company with a historic home that has created projects in an unconventional space in the hope of broadening its audience. Three years ago artistic director Kevin Spacey and his assistant Hamish Jenkinson were attending an event organised by graffiti artist Banksy on London's Leake Street, a road which runs beneath Waterloo station with walls which are used as a canvas by street artists. Jenkinson discovered a door which led into thousands of square feet of disused tunnels. He says: "To discover a space like that in the heart of London, three minutes from the Old Vic – I could feel it calling out to me."

Jenkinson became creative director for the tunnels and with the assistance of Punchdrunk organised the venue's first show, *Tunnel 228*. Since then it has staged a variety of art, cinema and theatre events and has become home to several projects for the Old Vic New Voices, a programme which aims to inspire young people and open up the theatre to diverse audiences.

Meanwhile the Royal Court Theatre, based in London's Sloane Square, has recently sought to engage new audiences through a rather smaller, if no less unusual venue – a retail unit in the Elephant & Castle shopping centre in south London. This year the shop became the stage for six productions that transferred from the Royal Court, while curious passers-by looked on through its plate-glass window.

According to Royal Court head of production Paul Handley, the project, known as Theatre Local, was an attempt to bring live drama to people who would be uncomfortable in Sloane Square: "We all feel conscious that we sit in one of the most privileged parts of London and



school parties from Peckham can be visibly intimidated by their surroundings," he says.

However, Handley admits that it was difficult to know how many locals attended, and how many of the audience were a regular West End crowd in search of a piece of 'event' theatre. Another season of Theatre Local is planned, with more tickets likely to be sold to passers-by, rather than through the Royal Court box office.

Performing in unusual venues presents a special set of challenges for dance companies. Not all spaces are conducive to such a physical art form. However, Big Dance 2010, an event funded by Legacy Trust UK, which aims to secure a cultural and sporting legacy for the London 2012 Olympics, saw companies such as the English National Ballet and Sadler's Wells performing in an artist-designed, portable Big Dance Bubble at several London locations, with other companies performing outdoor and site-specific pieces. Anne Hartley, Big Dance coordinator at the Arts Council, says that 2010's event attracted 1.2 million people, many of whom would not usually have attended a dance performance. Hartley confesses that the bubble presented some challenges for performers because of its uneven floor, coupled with high temperature in the summer weather.

Despite the practical difficulties, unusual performance spaces present an opportunity to reach a wider audience – a consideration that is certain to tempt more companies to step outside their theatre doors. ■

### Author

**Stuart Watson** writes on the built environment and is artistic director of Putney Arts Theatre, a community venue in south London



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GENEXIS THEATRE

RUTH SLAVID

# Mind over matter.

*Resembling a huge brain suspended high in the air, Singapore's Genexis Theatre proved a challenging prospect for both its designers and acousticians*







## GENEXIS THEATRE



The Genexis Theatre – an egg-shaped 'brain' suspended between the two towers of Fusionopolis

When the sixth Decade of the Mind conference was held in October 2010, it was the first such event to take place in Asia. It was held at the Genexis Theatre at Fusionopolis in Singapore, a venue that the organisers considered appropriate because Fusionopolis is a development that brings together different technologies, so that biological and engineering sciences converge. But there was a further factor that made this appropriate – the fact that the elliptical theatre has been dubbed, and indeed was conceived as, a 'brain'.

Its organic form was a given by the time the theatre design team was appointed. Supported on a single column, sitting at the junction of a number of towers, and sprinkled on the outside with stars at night, it is certainly an eye-catching centrepiece to an ambitious development. But in terms of the requirements for a working theatre, it was a difficult proposition, with few of the facilities that one would expect, and a shape that is an acoustician's bad dream.

The genesis of Genexis is as star-studded as the exterior. It sits in a new area of Singapore, masterplanned by one of the world's top architects, London-based Zaha Hadid. The

Fusionopolis building itself was designed by another superstar, Japan's Kisho Kurokawa, who died partway through the project. Set amongst the towers, almost floating in space, the sparkling brain provides both focus and punctuation. Kurokawa had conceived it as a centre of thought, a place where all the clever thinking done within Fusionopolis could be brought together.

The initial intention was that Genexis would merely provide a venue for tenants of Fusionopolis to launch products and to hold conferences. But when JTC, the client for the project, appointed Arup as the lead consultant, there was a realisation that it could be used to do something more. Arup and JTC carried out extensive research and visited a number of venues in Singapore. They concluded that the area would benefit from an experimental theatre and that Genexis was well placed to provide it. "They wanted it to be a go-to place for the arts," says Andrew Nicol, who led the project for Arup.

Arup, which swiftly appointed Theatreplan from London to collaborate on the theatre design, and subsequently Singapore-based WOHA as interior designer, became involved early enough to have some impact on the shell design. "We created a lift space in one of the

Some 400,000 timber beads make up the acoustic panels – beads are either open or closed to optimise sound quality



## Ball control

Despite the deliberately rough and ready appearance of the Genexis Theatre's walls – lined as they are with timber balls – this is actually a highly sophisticated and unique acoustic solution, according to Arup's Andrew Nicol. Each of the wooden balls is hollowed out with a 25mm void at the centre, and the balls are then attached to a backing of acoustically absorbent material. If one looks closely at the walls, it can be seen that the direction of the holes in each ball varies, and this is anything but random. Where the sound waves strike the solid faces, they will be reflected; if they pass through the holes to the backing, they will be absorbed. To prevent 'bad' reflections, certain areas on the sidewalls have been made entirely dead.

As a result, explains Nicol, "we have been able to design the acoustic to be a little livelier, but still get excellent clarity". It was, he adds, "an incredibly complex piece of acoustics and interior design. I don't think I have ever done an interior like this before".

The contractor could not find a suitable manufacturer to make the 400,000 timber beads, so they were all made by hand in a village in Indonesia and fixed individually to the backing.



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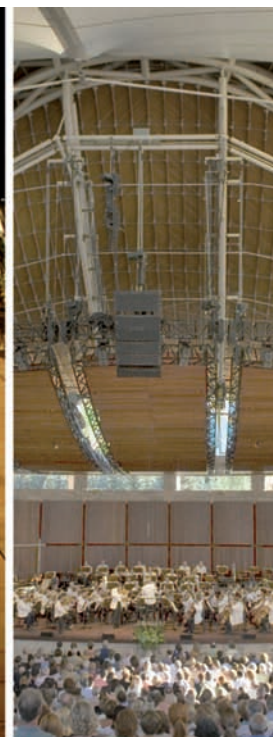
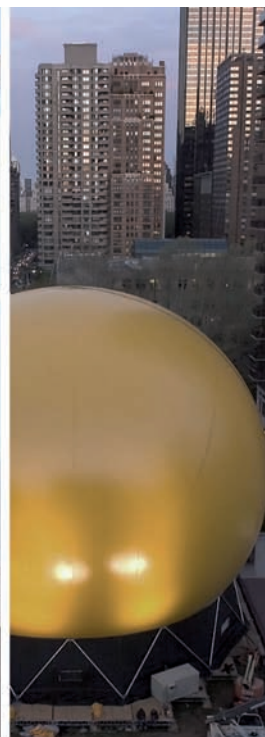
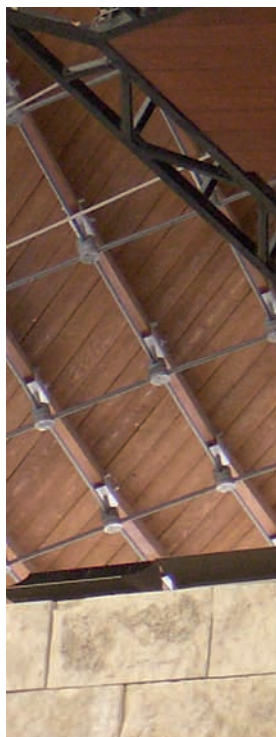
Fusionopolis Singapore (SG)  
seating model Armada



O2 Arena Dublin (IE)  
seating model Sport 5

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cores, with a link to backstage,” continues Nicol. Arup’s structural engineers were also able to pare back some of the supporting steel structure contained within the brain, reducing the overall weight by about a third.

### Brain teaser

This was not an easy project. The egg shape of the brain, while undeniably dramatic, was a potential acoustic disaster, because it would encourage reverberation. There was in effect no backstage area, floor loadings were limited, and there was no level access.

But from this unpromising start, the team produced a theatre that in 2009 won the Design of the Year award, which was presented by Singapore’s president. And the theatre is fulfilling its mission of hosting a wide range of events, from the launch of the country’s Digital Advertising Alliance to the staging of *The Emperor’s New Clothes* by the Kids Performing Repertory Theatre, complete with a bicycle parade and parasol dance.

Total seating capacity is 560, with some seats on back and side balconies and the remainder, at ground level, able to be arranged in any configuration, with a proscenium stage, a thrust stage or an entirely flat floor. And while it is possible to create an entirely neutral backdrop, the theatre has a funky, textural feel, which will surprise but not disappoint those led to expect something special by the flamboyant exterior.

When Arup appointed WOHA to carry out the interior design, says Nicol, “That was a real coup for the client – they were the coolest

architects in Singapore.” Richard Hassell, one of the founding directors of WOHA, says that his practice went for an aesthetic that was in deliberate contrast to the rest of Fusionopolis: “It was all rather slick,” he explains, “so we gave them something rougher.”

One of the venue’s most striking interior features is its use of wood. Visitors come first to the bar and foyer space, housed in one of the towers on the fourth level of the building. There the timber is used in the form of irregular vertical ribs descending from the ceiling and bulging out in waves from the core. Coupled with the brightly coloured seating that is scattered around, like

Retractable seating and multiple rigging and lighting provisions allow for various stage arrangements







Seating can be fully retracted to create an entirely flat floor for a wide range of performances and events

## Totally wired

Genexis was the first studio theatre in Singapore to have a tension-wire grid. This is a visually and acoustically transparent floor at high level, which allows equipment, including lighting and auditory equipment, to be placed at any position on the ceiling, adding greatly to the flexibility of the space. Acoustically, it means that speakers can be lowered at any appropriate point. Nicol believes the space will work effectively for any application except a symphony orchestra, which in any case would not physically fit inside the theatre, and for which Singapore is already well equipped.

half-sucked sweets, it almost entirely subverts the rather bland corporate feel imparted by the glazing and columns. This is a space that JTC wanted to be a destination in its own right, attracting not only theatregoers and those who work in the building, but also visitors to the ground-floor shops.

Those visitors who are going to the theatre then take an escalator up to the sixth level, where it debouches them straight into the theatre. Again their first impression will be of wood, because the space is lined with wooden balls, resembling a giant version of those massaging car seatbacks so beloved of taxi drivers. These balls, each 50mm in diameter and stuck to acoustic backing, are the solution to the particular acoustic problems that the rounded shape of the theatre presented.

Acoustics, important as they are, were only one element in making this space work as a theatre. Having curved walls makes everything more complex. For example, the 'get-in' door is actually a large plug on wheels – because a door cannot be hinged within a curved wall.

## Flexible stage and seating

The choice of seating is crucial in a building that needs this degree of flexibility. Here it comes from Belgian company Jezet and can be retracted in two halves, either forming straight raked seating facing a proscenium stage, or arranged to either side of a thrust stage. When fully retracted, the seating forms a stack. It sits on air castors, which are operated by compressed air. All this is fairly standard procedure for adaptable theatres. What is not standard is that, first, the floor loadings had to be checked to ensure they could support the stack. Second, there is a 'bird's nest' on top of the seating, a control tower for all the effects. Normally, this would be outside the main space, but in this case there is no 'outside'.

Whatever stage arrangement is selected, the 'stage' itself has to remain flat on the floor, since there is no depth within the floor to contain a 'rise'. Similarly, there is no fly tower and this means the panels that come down to form the proscenium have to be in three parts so that they can slide over each other and then hinge up to the ceiling. The sides of the proscenium are closed off with curtains. "Imagine trying to make a curtain go up a curved wall," says John Whitaker of Theatreplan. "It doesn't."

But despite the restrictions, the theatre is as technically advanced as possible, with a tension wire grid ceiling, and a generous array of lights, all with recessed sockets. There may be no room for a smoke machine, and no mirrored walls, but theatre as we know is still all about smoke and mirrors. Audiences will scarcely be aware that the foyer is in one tower, the lavatories in another, that curving the services up the wall was a nightmare, and that pushing props up a 1:12 ramp is less than ideal. Instead, having been drawn in by its iconic 'brain' exterior, they will find themselves inside it, in an extraordinary, adaptable and enjoyable space. ■

### Author

**Ruth Slavid** is an architectural author and journalist, based in London



Curved ribs of plywood punctuate the bar and lobby areas





Design that performs

Grand Canal Theatre © Ros Kavanagh

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# American idols

An impressive 19 new or renovated US performing arts centres valued at US\$1,233 billion are set to open in 2010 and 2011, including nine campus venues





**Hylton Performing Arts Center,  
George Mason University/  
Prince William, Manassas, VA**  
JUNE 2010

**Cost** US\$44.6 million

**Capacity** 1,166-seat Merchant Hall,  
300-seat Gregory Family Theater

**Owner** George Mason University,  
Prince William County, City of  
Manassas

**Operator** GMU

**Major tenants** George Mason  
University, Prince William Symphony,  
Manassas Ballet Theater, Prince  
William Youth Orchestra

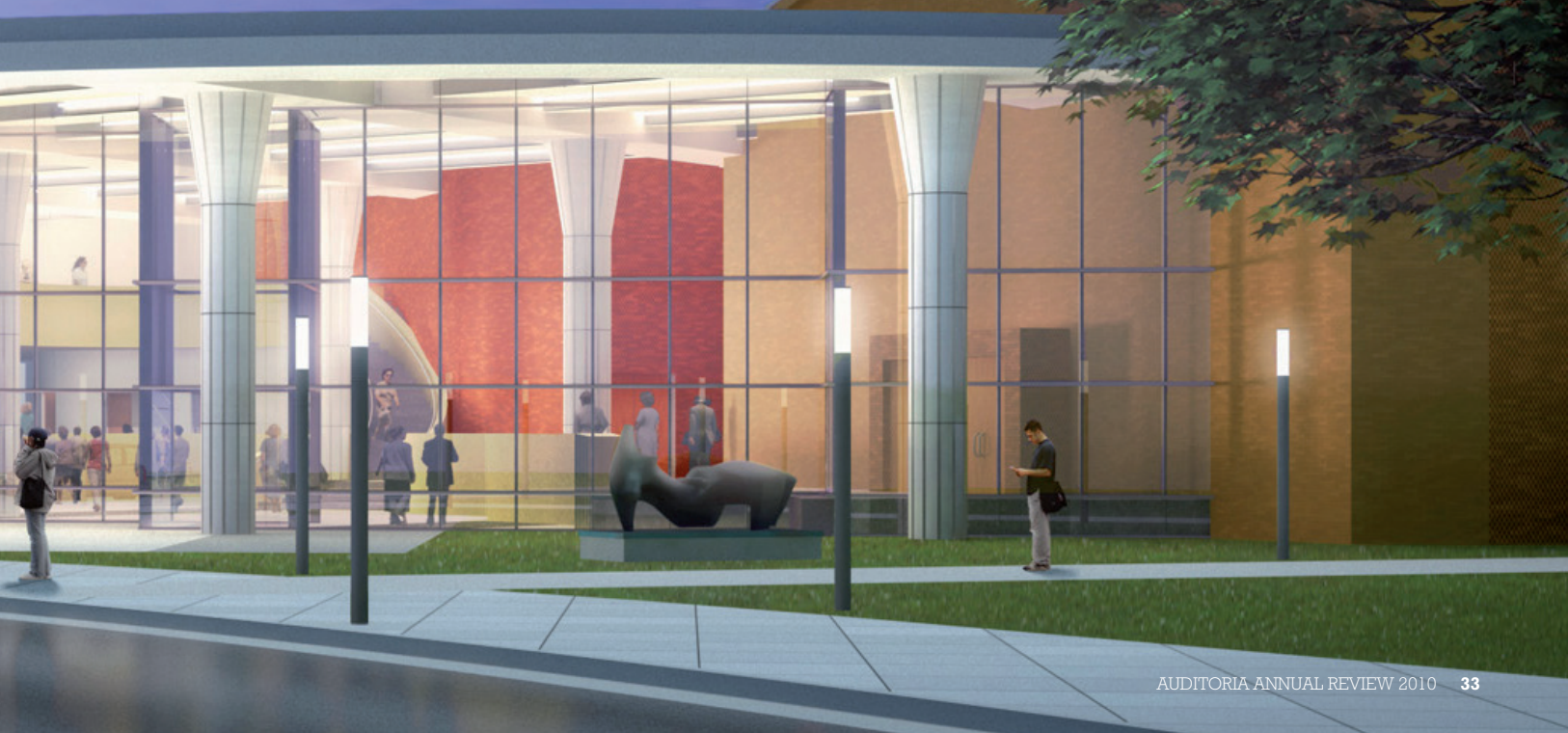
**Architect** Holzman Moss Bottino  
Architecture & Hughes Group  
Architects

**Acoustics** BAi

**Theatre consultant** Robert Davis

**F&B** George Mason University

**Amenities** 86,000ft<sup>2</sup> PAC includes  
horseshoe-shape concert hall with  
27 family boxes; 10,000ft<sup>2</sup> Didlake  
Grand Foyer; Buchanan Partners  
Visual Arts Gallery; Patrons Lounge;  
catering kitchen; scene, paint and  
costume shops; dressing rooms;  
administrative offices





## NEW US PERFORMING ARTS CENTRES

### Donald & Maureen Green Music Center, Sonoma State University, Rohnert Park, CA

FEBRUARY 2010 Phase 1

**Cost** US\$110 million  
**Capacity** 1,400-seat concert hall, 250-seat Schroeder's Recital Hall  
**Owner** State of California and California State University  
**Operator** Sonoma State University  
**Major tenants** Sonoma State University, Santa Rosa Symphony  
**Architect** William Rawn Associates, BAR Architects, AC Martin Architects  
**Acoustics** Kirkegaard Associates  
**Theatre consultant** Auerbach, Pollock, Friedlander  
**F&B** Sonoma State University  
**Amenities** 5,508ft<sup>2</sup> Prelude Hospitality Center & Executive Conference Room opened February 2010; Phase 2 is concert hall; East Lawn seating for 10,000; Phase 3 is Schroeder's Recital Hall; rehearsal rooms; classrooms; faculty offices

### Columbia Theatre for the Performing Arts, Longview, WA

FEBRUARY 2010

**Cost** US\$11.6 million renovation  
**Capacity** 815 seats  
**Owner** City of Longview  
**Operator** Columbia Theatre Association for the Performing Arts  
**Major tenants** Columbia Theatre Association, Vancouver Symphony, Southwest Washington Symphony, Community Concert Association, High Step Dance Academy  
**Architect** LMN Architects  
**Acoustics** Yantis Acoustical Design  
**Theatre consultant** The Shalleck Collaborative  
**F&B** Local caterers  
**Amenities** Historic 1925 theatre renovation included expanded lobby; new wider seating; new sound and lighting systems

### Clayton Center for the Arts, Maryville, TN

MARCH 2010

**Cost** US\$47.3 million  
**Capacity** 1,196-seat Proscenium Theatre, 252-seat Recital Hall, 200-seat Flex Theatre  
**Owner** Cities of Maryville & Alcoa, Maryville College  
**Operator** Maryville College  
**Major tenants** Appalachian Ballet Company, Foothills Community Players, Primary Players, Steve Kaufman Acoustic Guitar Concert Series  
**Architect** McCarty Holsaple McCarty  
**Acoustics** Creative Acoustics  
**Theatre consultant** Theatre Consultants Collaborative  
**F&B** Preferred Caterers  
**Amenities** Two-building complex (Ronald and Lynda Nutt Theatre and Harold and Jean Lambert Recital Hall/Haslam Family Flex Theatre) connected by 500-capacity outdoor plaza



Prelude Hospitality Center at Green Music Center, Sonoma State University, CA



Palladium Concert Hall at The Center for the Performing Arts, Carmel, IN



Austin City Limits Live at Moody Theater, Austin, TX

### Acadiana Center for the Arts, Lafayette, LA

NOVEMBER 2010

**Cost** US\$15 million addition  
**Capacity** 300-seat theatre  
**Owner** Lafayette Consolidated Government  
**Operator** Acadiana Center for the Arts  
**Major tenant** Acadiana Center for the Arts  
**Architects** Southwests and Eskew+Dumez+Ripple  
**Acoustics** Akustics  
**Theatre consultant** Theatre Projects Consultants  
**F&B** The French Press  
**Amenities** New theatre has removable seating for 7,400ft<sup>2</sup> floor area; re-configurable staging; adaptive acoustics; café; workshop; meeting spaces

### The Center for the Performing Arts, Carmel, IN

JANUARY 2011

**Cost** US\$150 million  
**Capacity** The Palladium 1,600-seat concert hall, The Tarkington 500-seat proscenium theatre, 200-seat studio theatre  
**Owner** City of Carmel  
**Operator** The Center for the Performing Arts  
**Major tenants** Civic Theatre, Carmel Symphony Orchestra, Central IN Dance Ensemble, IN Wind Orchestra, Gregory Hancock Dance, Actors Theatre of IN, Carmel Repertory Theatre  
**Architect** David M. Schwarz and CSO Architects  
**Acoustics** Artec  
**Theatre consultant** Artec  
**F&B** TBD  
**Amenities** Traditional shoebox Palladium inspired by Palladio's 16<sup>th</sup> century Villa La Rotunda with adjustable glass acoustic canopy system; Indiana Limestone exterior

### Austin City Limits Live at Moody Theater, Austin, TX

JANUARY 2011

**Cost** US\$40 million  
**Capacity** 3,000 seats  
**Owner** Stratus Properties and Canyon-Johnson Urban Fund  
**Operator** Stratus Properties  
**Major tenants** Austin City Limits TV show  
**Architect** Andersson-Wise Architects and Christopher Sanders  
**Acoustics** Steven Durr  
**Theatre consultant** Theatre Consultants Collaborative  
**F&B** TBD  
**Amenities** Keystone of new downtown W Hotel project; live studio theatre with seating adjustable down to 1,500; two balconies; custom Meyer Sound System; High End Systems lighting package; four dressing rooms; three loading docks



**Forbes Center for the Performing Arts, James Madison University, Harrisonburg, VA**  
JUNE 2010

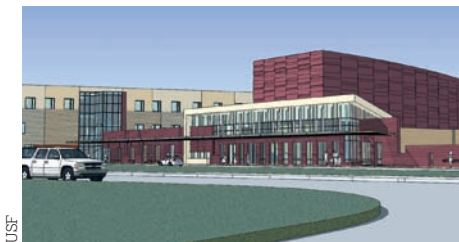
**Cost** US\$91.5 million  
**Capacity** Concert Hall (600 seats), Mainstage Theatre (450 seats), Recital Hall (196 seats), Studio Theatre (200 seats), Earlynn J Miller Dance Theatre (200 seats)  
**Owner** James Madison University  
**Operator** James Madison University  
**Major tenants** James Madison University School of Theatre & Dance and School of Music  
**Architect** Hanbury Evans Wright Vlattas  
**Acoustics** Jaffe Holden  
**Theatre consultant** Theatre Projects  
**F&B** Aramark Food Services  
**Amenities** Downtown complex includes Dorothy Thomasson Estes Center for Theatre & Dance and Shirley Hanson Roberts Center for Music with five theatre spaces; grand lobby and mainstage lobby; classroom; rehearsal and office facilities

**Lincoln Hall, Portland State University, Portland, OR**  
SEPTEMBER 2010

**Cost** US\$31 million renovation  
**Capacity** 465-seat performance hall, 220-capacity recital hall, 80-seat studio theatre  
**Owner** State of Oregon  
**Operator** Portland State University  
**Major tenant** Portland State University  
**Architect** Boora Architects  
**Acoustics** Sparling  
**Theatre consultant** Shalleck Collaborative  
**F&B** Portland State University  
**Amenities** Renovation of oldest campus building includes seismic bracing; new roof and mechanical systems; roof solar panels; new seating

**Arena Stage at the Mead Center for American Theater, Washington, DC**  
OCTOBER 2010

**Cost** US\$135 million expansion/renovation  
**Capacity** 683-seat Fichandler Stage, 514-seat Kreeger Theater, 218-seat Arlene and Robert Kogod Cradle  
**Owner** Washington Drama Society (T/A Arena Stage)  
**Operator** Arena Stage  
**Major tenant** Arena Stage  
**Architect** Bing Thom Architects  
**Acoustics** Talaske Group  
**Theatre consultant** Fischer Dachs Associates  
**F&B** Jose Andrés Catering with Ridgewells  
**Amenities** Built around the original Fichandler Stage and Kreeger Theater, the 200,000ft<sup>2</sup> complex includes glass-enclosed atrium lobby linking all three spaces; technical and costume shops; rehearsal halls; education spaces



USF  
New University of South Florida Music School Building, Tampa, FL



Nic lehoux/bing thom architects  
Mead Center for American Theater, Washington, DC



Davis Architects  
City of Tuscaloosa Amphitheater, Tuscaloosa, AL

**New University of South Florida Music School Building, Tampa, FL**  
FEBRUARY 2011

**Cost** US\$46.6 million  
**Capacity** 485-seat concert hall, 116-seat recital hall  
**Owner** State of Florida  
**Operator** University of South Florida  
**Major tenant** University of South Florida  
**Architect** Hanbury Evans Wright Vlattas  
**Acoustics** BAI Consultants  
**Theatre consultant** Performance Architecture/Michael Howard  
**F&B** N/A  
**Amenities** Three-storey, 113,535ft<sup>2</sup> music building with performance, rehearsal, practice, teaching, classroom, storage, office spaces organised along sweeping public diagonal arcade-lobby corridor axis; concert hall and recital hall both acoustically tunable; Phase 2 will add a 1,200-seat main concert performance hall

**Monarch Theatre & Diehn Complex Addition, Old Dominion University, Norfolk, VA**  
APRIL 2011 Phase 1

**Cost** US\$22 million  
**Capacity** 150-seat Black Box theatre  
**Owner** Old Dominion University  
**Operator** Old Dominion University  
**Major tenants** ODU Symphony Orchestra, Wind Ensemble, Concert Choir, Jazz Choir, Jazz Ensemble  
**Architect** Boora Architects & Moseley Architects  
**Acoustics** Jaffe Holden  
**Theatre consultant** Jaffe Holden  
**F&B** Old Dominion University  
**Amenities** 22,000ft<sup>2</sup> Black Box theatre; 2012 completion for 18,000ft<sup>2</sup> Diehn addition with choral and dance rehearsal space, ensemble rooms, classrooms and offices

**City of Tuscaloosa Amphitheater, Tuscaloosa, AL**  
SPRING 2011

**Cost** US\$15 million  
**Capacity** 7,300  
**Owner** City of Tuscaloosa  
**Operator** Red Mountain Entertainment  
**Major tenants** Local Arts Groups, Major Artist Tours  
**Architect** Davis Architects  
**Acoustics** Talaske Group  
**Theatre consultant** Incognitus  
**F&B** Event Concessions  
**Amenities** 45 VIP boxes; VIP lounge/bar, VIP patio/plaza; administration/ticketing, production, staff/first-aid buildings; commissary



## NEW US PERFORMING ARTS CENTRES

### Kauffman Center for the Performing Arts, Kansas City, MO

SEPTEMBER 2011

**Cost** US\$373 million

**Capacity** 1,800-seat Muriel Kauffman Theatre, 1,600-seat Helzberg Hall

**Owner** Kauffman Center for the Performing Arts (KCPA)

**Operator** KCPA

**Major tenants** Kansas City Ballet, Lyric Opera of Kansas City, Kansas City Symphony

**Architect** Moshe Safdie Architects/Moshe Safdie

**Acoustics** Nagata Acoustics/Yasuhisa Toyota

**Theatre consultant** Theatre Projects Consultants/Richard Pilbrow

**F&B** KCPA

**Amenities** 285,000ft<sup>2</sup> complex with two halls housed within over-arching shell with Brandmeyer Grand Lobby featuring glass roof and walls anchored by 27 steel cables simulating a stringed instrument

### Francis Marion University Performing Arts Center, Florence, SC

AUTUMN 2011

**Cost** US\$33 million

**Capacity** 861-seat Proscenium Theater, 100-seat Black Box Theater, 500-seat Amphitheater

**Owner** State of SC, City of Florence

**Operator** Francis Marion University

**Major tenants** Francis Marion University, Florence Symphony Orchestra, MasterWorks Choir

**Architect** Holzman Moss Bottino Architecture

**Acoustics** Akustics

**Theatre consultant** Theatre Consultants Collaborative

**F&B** N/A

**Amenities** 9,000ft<sup>2</sup> lobby; proscenium theatre with orchestra and balcony; portable orchestra shell; six box and four partiere seating areas; Academic Wing with Technology Lab; practice rooms

### PlayhouseSquare Allen Theatre Complex, Cleveland, OH

AUTUMN 2011

**Cost** US\$29 million renovation/expansion

**Capacity** 500-seat main stage theatre, 300-seat second stage theatre, 150-seat lab theatre

**Owner** PlayhouseSquare

**Operator** PlayhouseSquare; Cleveland Play House; Cleveland State University

**Major tenants** Cleveland Play House, Cleveland State University

**Architect** Westlake Reed Leskosky

**Acoustics** Telaski

**Theatre consultant** Westlake Reed Leskosky

**F&B** PlayhouseSquare

**Amenities** Transformation of 1921 Allen Theatre into 500-seat main stage theatre; two new theatres (300-seat changeable from thrust to runway to in-round to end-stage set-ups and 150-seat Black Box with tension grid); grand lobby; pedestrian walkway to parking garage



Moshe Safdie Architects

Kauffman Center for the Performing Arts, Kansas City, MO



Rhotenberry Wellen Architects

Wagner Noël Performing Arts Center, Midland-Odessa, TX



Holzman Moss Bottino architecture

Main entrance into lobby at Southern Kentucky Performing Arts Center, Bowling Green, KY

### Parker Arts, Cultural and Events (PACE) Center, Parker, CO

AUTUMN 2011

**Cost** US\$16.5 million

**Capacity** 537-seat main theatre

**Owner** Town of Parker

**Operator** Town of Parker

**Major tenants** Apex Dance, Parker Chorale

**Architect** Semple Brown Design

**Acoustics** Robert F. Mahoney Associates

**Theatre consultant** OCCAM Theatre Planning and David L. Adams Associates

**F&B** N/A

**Amenities** Main theatre includes Gala Spiralift orchestra pit, Wenger shell, JR Clancy powered rigging, and Camatic seats; 200-seat flexible venue space includes catering/teaching kitchen; two multipurpose rooms; two visual arts rooms

### Wagner Noël Performing Arts Center University of Texas of the Permian Basin, Midland-Odessa, TX

LATE 2011

**Cost** US\$81 million

**Capacity** 1,800-seat performance hall, 200-seat Greathouse Rea Recital Hall

**Owner** University of Texas Board of Regents

**Operator** University of Texas of the Permian Basin

**Major tenants** University, Midland-Odessa Symphony and Chorale, Broadway Series

**Architect** Boora Architects and Rhotenberry Wellen Architects

**Acoustics** Jaffe Holden Acoustics

**Theatre consultant** Auerbach Pollack Friedlander

**F&B** N/A

**Amenities** Three-level grand lobby; eight-storey performance hall with two balconies and proscenium; kitchen; dressing rooms; recital hall with telescopic theatrical seating; 1,000-vehicle parking

### Southern Kentucky Performing Arts Center (SKyPAC) Bowling Green, KY

LATE 2011

**Cost** US\$25 million, Phase 1

**Capacity** 1,800-seat proscenium theatre

**Owner** Warren County

**Operator** SKyPAC

**Major tenants** Local Community Groups

**Architect** Holzman Moss Bottino Architecture and Ross Tarrant Architects

**Acoustics** Jaffe Holden

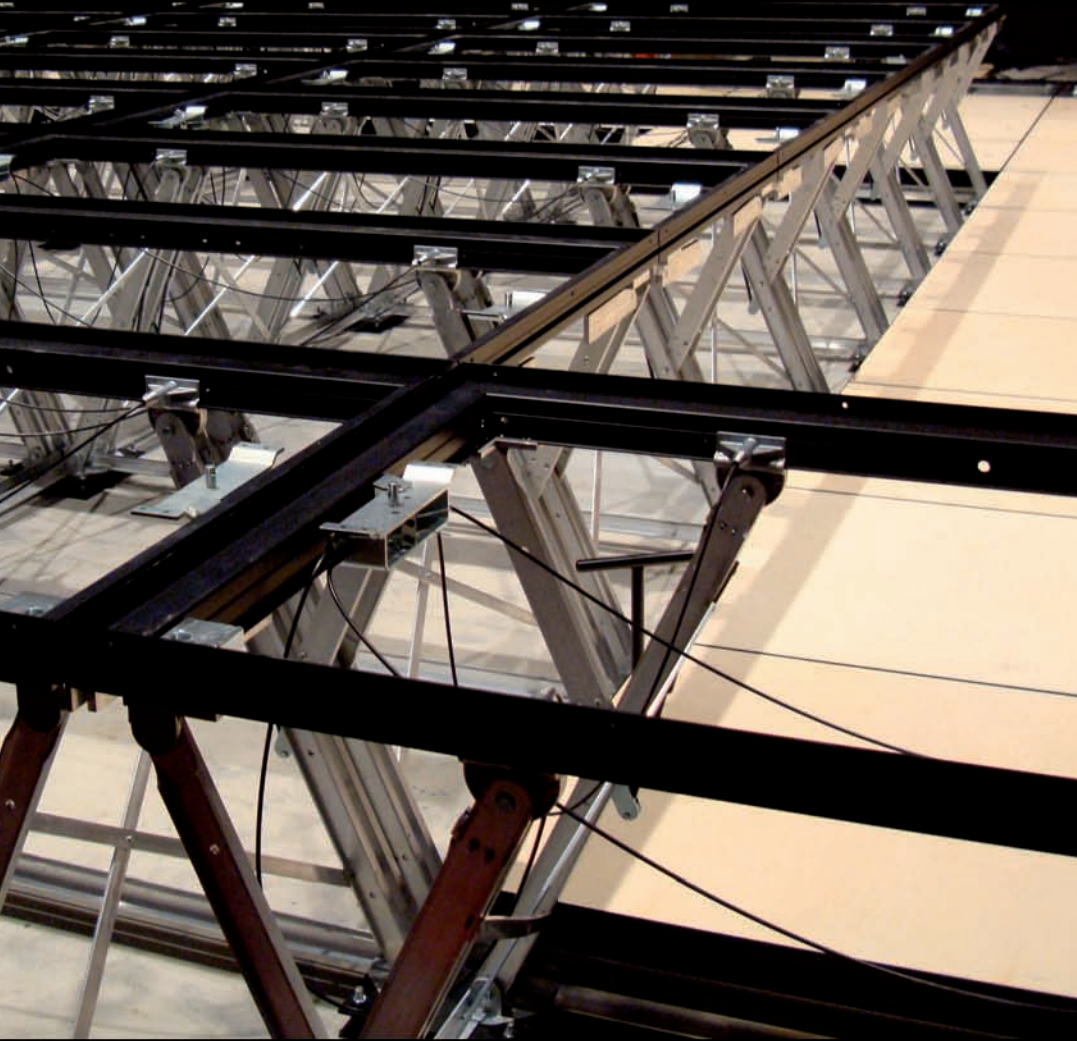
**Theatre consultant** Peter George Associates

**F&B** TBD

**Amenities** Multipurpose theatre; studio theatre; lobby; gallery; donors' lounge; rehearsal rooms; performance support spaces; Phase 2 will include renovation of Capitol Theatre to 450-seat community theatre



*If our answer is yes - What was your question?*





**GRAND CANAL THEATRE**  
SARAH RUSHTON-READ





Designed by Daniel Libeskind, Dublin's brand new Grand Canal Theatre is the jewel in the crown of the city's recent architectural and cultural transformation

# GRAND CANAL THEATRE

**T**he Grand Canal Theatre is a confident and imposing five-storey modern building with a fascia of sharply angled steel and glass that rises majestically from the waterfront of the Grand Canal Harbour in Dublin, Ireland. The theatre provides the main façade of a large public piazza, designed by Martha Schwartz Partners, and is flanked by a five-star hotel and a residential development on one side and an office block on the other.

"Dublin is a city resurrected over the last 10 years and it's just breathtaking what has happened," says the theatre's world-renowned architect, Daniel Libeskind. "It has been transformed from an ancient city to one that is vibrant – it's youthful, it's exciting, it's dynamic. I believe that's what architecture can do for a city, and cultural institutions such as the Grand Canal Square Theatre will just add to that incredible atmosphere."

The whole concept of the Grand Canal Theatre is based on stages: the stage of the theatre itself, the 'stage' of the piazza, and the stage created by the multiple-level theatre lobby above the piazza. Its striking angular design and red glazed paving mimic a red carpet to its door, leading visitors from the water at the canal dock to the theatre entrance, while underlining its presence as the focal point of the square. The façade comprises two apparently overlapping, folding glazed screens, revealing glimpses of various levels of the theatre foyers, with the main entrance situated between – visitors enter as if through a stage curtain.

Inside, the theatre's auditorium design alludes to the shipbuilding of the former docklands area. Suspended 'sails' conceal technical gantries and equipment while the large protruding 'rib' volumes on the sidewalls evoke timber members of an old boat's hull. In stark contrast to the exterior, the auditorium design has the rich



## GRAND CANAL THEATRE

The 2,111-seat auditorium  
(right, below) design draws  
on shipbuilding imagery in  
reference to its docklands  
location and history

opulence and glamour of a Victorian theatre – albeit with a rather more modern aesthetic.

Architectural practice Daniel Libeskind AG led a group of world-class design firms and consultancies, including McCauley Daye O'Connell Architects, Arup, RHWL - Arts Team Architects, Billings Design Associates, Pritchard Themis, Michael Slattery & Associates, Davis Langdon PKS, and Bruce Shaw Safety Management. John Sisk & Son Ltd acted as the general contractor on the project. Together, they have compromised on nothing. The theatre is not only spectacular as a building but it's packed to the grid with state-of-the-art technology and infrastructure, expensive finishes and delightful design flourishes.

And it needs to be – there's considerably more riding on this venue's success than professional and national pride. It's no secret that in recent years Ireland has suffered one of the most dramatic economic 'boom and bust' rollercoaster rides in Europe. Today Dublin remains hard hit by the global economic crisis and part of its economic recovery is going to rely on attracting the levels of leisure, cultural and business tourism it saw in its boom days.

### Conventional wisdom

The city certainly has the infrastructure to support this with plenty of chic restaurants and bars, a plethora of boutique and five-star hotels and regular scheduled flights from most European cities. In addition, the nearby, much heralded and recently opened Dublin Convention Centre could offer ample opportunities for event organisers to plan large-scale corporate entertainment events well in advance.

This perhaps explains the ambitious, 2,111-seat capacity. No other city in Ireland could sustain a venue with a seven-day-a-week programme on such a scale. To further maximise business and public use of the building, Grand Canal Theatre also offers private conference room hire, a rooftop terrace with panoramic waterside views, in-house catering, seven bars and full audio visual and corporate hospitality facilities.

It's anticipated by the venue's Live Nation management that Grand Canal Theatre will establish a strong reputation with top tour producers as the finest receiving house in Europe, and as a result bring cultural tourism back to Dublin from the rest of Ireland, the UK, Europe and beyond. And so far at least, the plan seems to be working. The Grand Canal opened on 18 March 2010 to critical acclaim with a production by the Russian State Ballet of *Swan Lake*. Since then it has hit the ground running and so far a string of popular productions have passed through its dock doors including: *Chitty Chitty Bang Bang*, *Fame*, Rufus Wainwright and Derren Brown, *Hairspray* and *Rocky Horror*.

### Road test

With such a diverse assortment of world-class productions to cater for, the flexibility and technical infrastructure in the auditorium had to be second to none. For Arup, the company tasked to provide the acoustic and technical theatre system design along with civil, structural and building services, the priority was to design flexible acoustic and technical theatre systems that would blend seamlessly with Libeskind's angular yet luxurious interior architecture.

Arup Theatre Consultants' Philip Heselton was responsible for project managing the design of the theatre's technical performance systems:









“This was a fast-track project,” he says. “The ink was barely dry on the plans before the first concrete was poured! Working in close association with Martyn Jenkins, Live Nation’s technical manager for the Grand Canal project, we began by drawing overlays of shows then out on the road to ensure they would fit easily into the new venue. The result is, Grand Canal is an extremely flexible venue.”

Sophisticated acoustic treatment, digital communications, stage and house lighting, AV and sound systems along with a comprehensive mixture of power and counterweight flying have all been installed. A flexible configuration of orchestra lifts facilitates a variable size pit and there are more power and tie lines secreted around the space than most visiting companies could find a use for.

### Best of both worlds

Paramount to the success of the room is the quality of the acoustic: “The brief for the Grand Canal Theatre was to create an acoustic principally suited to amplified West End shows, however it also had retain a suitably natural acoustic sympathetic to opera and other unamplified performance art forms,” explains Jeremy Newton of Arup Acoustics.

This has been achieved using a combination of acoustically responsive materials that visually and physically merge with the room’s interior architecture. Acoustically transparent metal mesh sails are carefully angled in the roof space to form an attractive, undulating, LED-lit,

floating ceiling, which allows sound to pass into the upper roof space and back out again. Sound reflecting surfaces hidden in the upper void are specifically designed and strategically positioned to reflect early sound back to the audience.

In addition the sidewalls of the auditorium are sculpted into a series of vertical ribs, angled in such a way as to reflect sound towards the centre of the room. The result is a clear and spacious acoustic. Purposefully positioned and incorporated into the ribs are sound transparent segments that allow the sidewall reflection to reach the audience at the back of the room. Where the geometry of the ribs is acoustically beneficial, the ribs are solid. Similarly the back walls have been shaped to prevent unnecessary reflection back to the stage from amplified sound.

“The acoustic is damped enough to enable the performance sound systems to deliver high-fidelity show sound yet remains sufficiently warm and reverberant to afford a warm sympathetic acoustic for opera,” continues Newton. This is helped by the use of specific surface mass used in the wall linings, which ensure the sound from an orchestra in the pit remains natural, rich and warm.

Balcony fronts have been shaped and sculpted to provide useful sound reflection to the seats in the balcony, while preventing adverse sound reflections back to the stage. Distinctive graphical relief work in balcony fascias – designed by Libeskind – also provides a level of high frequency scattering. The seats incorporate sound absorbing slots on the underside of the seat pan.

Suspended sails conceal technical gantries and allow sound to pass into the upper roof space

## Project background

The concept of The Grand Canal Theatre, Dublin first arose in 1992 following frequent requests from producers of ballet, operas, drama and musicals to Mike Adamson – CEO of Live Nation Ireland and then CEO of ‘The Point’ (now The O2 Dublin) – to stage their productions in Dublin.

In 2003 the idea really began to gather speed during discussions with Peter Coyne, CEO, and Grainne Hollywood, property director, of the Dublin Docklands Development Authority (DDDA). They wanted an iconic building at Grand Canal Square and the DDDA asked for Live Nation’s thoughts. “We presented the concept of a 2,000-seat capacity theatre to include a classic three-tier theatre auditorium,” explains Adamson. The DDDA eventually approved the idea and appointed ‘starchitect’ Daniel Libeskind, theatre architects RHWL Arts Team and developer Chartered Land to realise the vision.

Building commenced in January 2007 and the curtain rose for its inaugural performance on 18 March 2010 with The Russian State Ballet featuring stars from the Bolshoi performing *Swan Lake*.









**Lobby entrance area (top left); one of seven bars (top right); and even when viewed from behind, the theatre's exterior remains striking**

These limit the difference in the room acoustic between being occupied and unoccupied.

However where there is an element of acoustic variability is in the surfaces of the orchestra pit, which provides varying levels of absorption and reflection on demand. This means the space can be tuned for an amplified or orchestral sound. It can also be applied to prevent noise build up, ensuring better working conditions for the musicians. Even the balustrade between the orchestra and the audience is adaptable, which Newton says enables the string balance to be adjusted.

### Here to please

Of course a theatre is nothing without a skilled and accommodating workforce. Grand Canal's technical manager, Luke Child, has an extensive touring background and understands better than most what a good receiving house should be. Now he has a theatre of his own, he's determined to establish its reputation as the most outstanding, hospitable and supportive receiving house in Europe.

"I've toured to every theatre in the UK and can safely say Grand Canal is a truly excellent venue design," he says.

"The get in and set up here is a breeze; incoming companies wheel kit straight out of the truck and into a lift, which delivers direct to each of the various department levels including the stage. The pit lift comes right up to stage level enabling orchestra and sound to load straight in from the stage. No one has to worry about the rigging for a FOH rig – we have 12 motors up there that take a ton each. Speaker clusters are easy to hang – we have special pre-made frames that clip onto the motors. There are six motors on rolling beams running up and down stage so companies can position them anywhere they need!"

On stage there is a comprehensive combination of counterweight and motorised bars and hoists. Above the stage there are 62 sets of counterweight flying and seven motorised bars – five of which are in the standard lighting positions. There are also two motorised bars running up and down stage, one each side, plus motorised forestage rigging for lighting, PA and supertitles. Two lifts allow for variable pit configuration that accommodate both the smaller 13 or 14-piece bands associated with musicals or the large scale, 65 to 90-piece opera orchestras.

The automated element of the installation is overseen from a centralised Kinesys control system. In addition a lift, secured to the back wall of the auditorium, enables engineers to load sound consoles from an easily accessed space below the auditorium floor and lift it into position. Small seat wagons allow seats to be dropped down to storage underneath.

Local company Cine Electric installed sophisticated production lighting infrastructure, which offers considerable flexibility via site-wide ACN connections. "We installed a number of ETC Sensor dimmers and switched non-dim modules, which are controlled from an ETC EOS console or wireless riggers remote," explains Cine Electric's managing director, Michael O'Toole. "ETC Unison has been installed to control house and work lighting and the system includes touchscreen LCD stations and combined push-button/fader panels. The integration of Unison allows non-trained theatre personnel to adjust the lighting without having to call on a production electrician."

Since opening, the feedback from visiting companies, performers and audiences has been extremely positive. It's now down to how quickly Grand Canal can earn the kind of world-class reputation that will continue to attract the top-notch stars and shows and once again make the city one of Europe's top destinations for international leisure, cultural and business tourism. ■

### Author

**Sarah Rushton-Read** writes for numerous entertainment publications, including *Light & Sound International* and *Installation Europe*





# EVENT LIVE EXPO 2011

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**APRIL 12, 13, 14, 2011**

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## DESIGN

EPSTEIN JOSLIN ARCHITECTS / KIRKEGAARD ASSOCIATES / THEATRE CONSULTANTS COLLABORATIVE

# Musical masterpiece

Shalin Liu Performance Center is a world-class music hall aiming to help the arts flourish locally in US town, Rockport

**T**he Rockport Chamber Music Festival opened its 29<sup>th</sup> season in the summer of 2010 in its new home – the Shalin Liu Performance Center – a 335-seat concert hall

inserted within the rebuilt and expanded Haskins Building in downtown Rockport, Massachusetts, USA. By purchasing the historic property, Rockport Music acquired a site well embedded in the town, both facing Main Street and perched proudly on the seawalls of the Atlantic Ocean. The challenge of the design team – comprised of Epstein Joslin Architects, acoustician Kirkegaard Associates and Theatre Consultants Collaborative – was to ensure that one's memory of town, ocean and community would be entwined with warm and intimate encounters of world-class musical artistry. And in turn that it would be a place to help keep the art of music alive by supporting and inspiring the youth of the region to aspire to high levels of achievement in their own musical appreciation and studies.

The resulting magic emerged out of five conditions where particular attention was paid: exceptional acoustics; an intimacy among performers and audience that is framed by the extraordinary natural setting; the accessibility and sociability offered by the hall; a spectacular place to enjoy fine hospitality and congenial conversation; and a synergy of the building with a picturesque historic town and waterfront setting.

### Unrivalled acoustics

Every detail of the Shalin Liu Performance Center's design, from the hall's 30ft-high ceiling and its shoebox form, to the massiveness of its 1ft-thick concrete and plaster walls and

inch-thick laminated glass windows, to the blending quality of its stone veneer and bent wood finishes, has been guided and scrutinised for its ability to support a warm reverberant sound that is particularly well suited to chamber music of all genres.

"The sound is so clear and so full and vibrant... it's incredible," enthuses principal acoustician Larry Kirkegaard. "Acoustic isolation of the hall from its surroundings has been taken into consideration so that not only can one directly enjoy the music undisturbed by mechanical systems or exterior noises, but Rockport Music will have a room that offers a supportive environment for professional recording, an activity particularly sensitive to audible distractions."

### Merging sound and intimacy

In shaping the hall, the design team endeavoured to minimise the separation between performer and patron. The audience wraps around three sides of a stage that is set close to floor level. Cy Almey, a principal of Theatre Consultants Collaborative, explains: "We always look to enhance this fundamental interaction. The tight building site meant every seat would be close to the stage so our design challenge became how to optimise the individual experience when the seat locations and viewing angles were so different." Careful seat selection and custom chair details achieved the target audience size without compromise to the experience. Every seat has wonderful sightlines to the stage, where one can experience not only the emergent sound, but also the facial expressions of the musicians and the fingering of their instruments.

Pics unless stated Robert Benson











**The Shalin Liu Performance Center in downtown Rockport, Massachusetts (above); interior shots (opposite page)**

The grand backdrop to the stage, an 18 x 28ft floor-to-ceiling window, treats audience members to a stunning and never-ending visual drama of the changing tides, native granite, and broad-scaled cloud patterns. It is a serene scene well suited to classical and contemporary chamber music, one that merges place and event. Large wooden shutters and a velour drapery stored in pockets off-stage can be deployed to conceal a distracting view or light condition. The light passing through the shutters creates a scalloped, ripple effect, reminiscent of the water beyond.

The hall's interior finishes, largely Douglas fir, American walnut and variegated quartzite stone, embrace the cultural and natural legacies of the site, both stylistically and materially. "We wanted to weave everything together and to recall the colours of water and stone," says Deborah Epstein, who, with her business partner and husband Alan Joslin, designed the space. Theatre Consultants Collaborative principal Kyle Smith notes: "Performance lighting positions are tucked up beside the large wood roof trusses, which help to hide cables and equipment. We designed the theatrical systems to complement the performance and the room aesthetic, keeping technology largely out of audience view."

### Accessibility and sociability

The architecture supports the very important welcoming and socialising elements of Rockport Music and the Cape Ann community. Placement of the concert hall at street level offers a transparency through the lobby and a glimpse of the stage and harbour beyond – an enticement to concert-goers, town folk and tourists on the Main Street sidewalk to wander in, explore the offerings of the hall, and join its community.

Above the concert hall, a reception room resonates with the historic, public meeting room that once crowned the original Haskins Building. With its rebirth, the site once again serves its original public purpose. It hosts Rockport Music's own celebratory, entertainment or educational events, is rented to others, and is offered to the town of Rockport for civic assemblies.

Rockport Music is a constantly evolving social and educational hub in the Cape Ann area. By virtue of this, architects Epstein and Joslin drew on every possible means to create a sense of openness, invitation and ease of gathering through the facility. Joslin explains: "The hall, with audience access to the stage and the ocean window, is itself a lobby of sorts. The aisles, the low elevation of the stage, the loge and balcony railings all provide places where people can lean and linger, where they can watch and be watched, and where conversations can be struck, and friendships made or strengthened."

The lobby, designed purposely small, encourages audiences to spill out onto the sidewalk during intermissions, further energising the public space on the building's street façade by allowing it to become an integrated social space with the hall.

### Natural synergy

The synergy between building and town is evident in the design of its two 'front' faces – one to the main street, one to the harbour. The worn exterior of the original mercantile edifice was returned to its 1845 Second Empire splendour to enhance the charm of its historic village setting. The ocean-front façade has been reshaped to open all public rooms to the water and add a joyful and well-scaled face to the town's harbour edge. The Shalin Liu Performance Center serves as a proud and distinctive civic icon for Rockport Music and the Rockport community.

The hall has dramatically enhanced the experience of the Rockport Chamber Music Festival, and has positioned it alongside other revered summer festival venues such as Tanglewood, Marlboro, Aspen and Spoleto in bringing serious music lovers and musicians from around the world to join Cape Ann and Boston audiences in this extraordinary place for music-making. ■

[www.epsteinjoslin.com](http://www.epsteinjoslin.com)

[www.kirkegaard.com](http://www.kirkegaard.com)

[www.theatrecc.com](http://www.theatrecc.com)







Michael Lutch



Michael Lutch



Michael Lutch





# An eye on the future

Performing arts buildings must be designed for the long term in today's fast-changing world

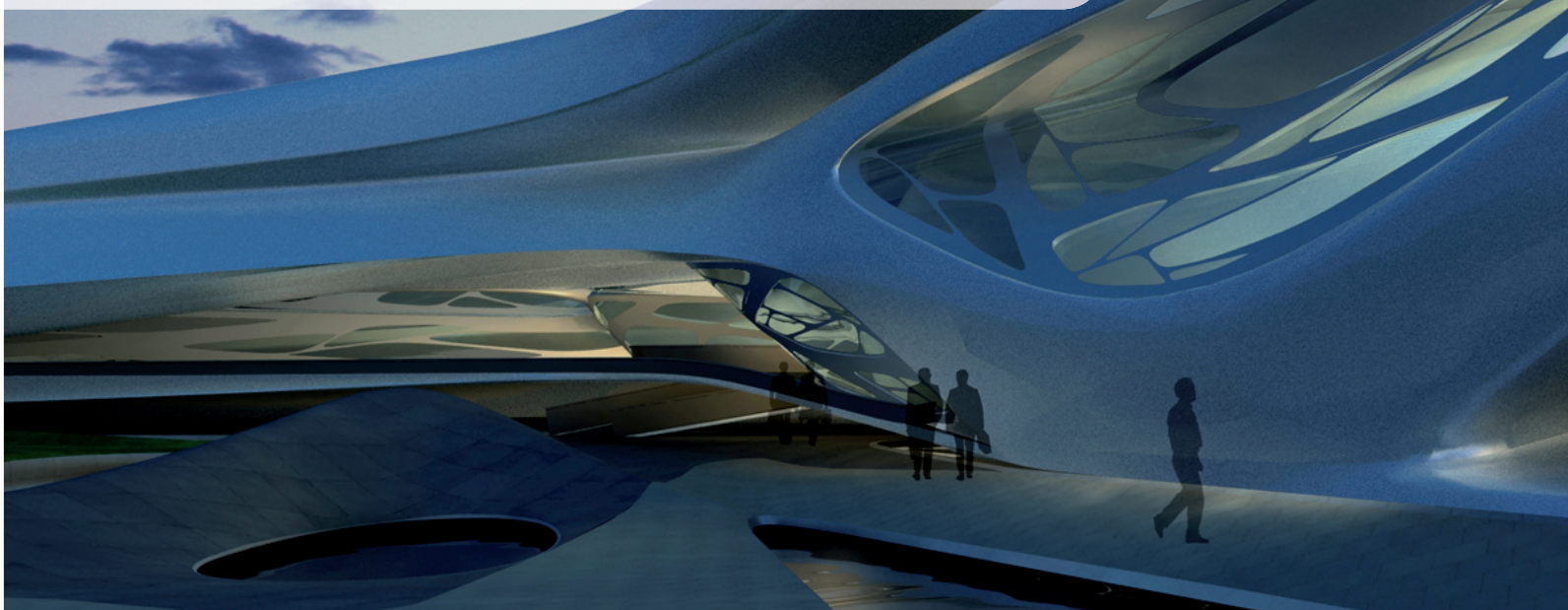
Cultural buildings not only reflect the place and aspirations of the client and community that they serve, but also speak to the world through the artists that visit and perform there.

A rewarding aspect of designing performing arts buildings is the continued creativity that happens within them. Unlike many other building types, which are complete on day one and only deteriorate through wear and tear, performing arts buildings are witness to, and absorb, great moments of transformation between performer and audience.

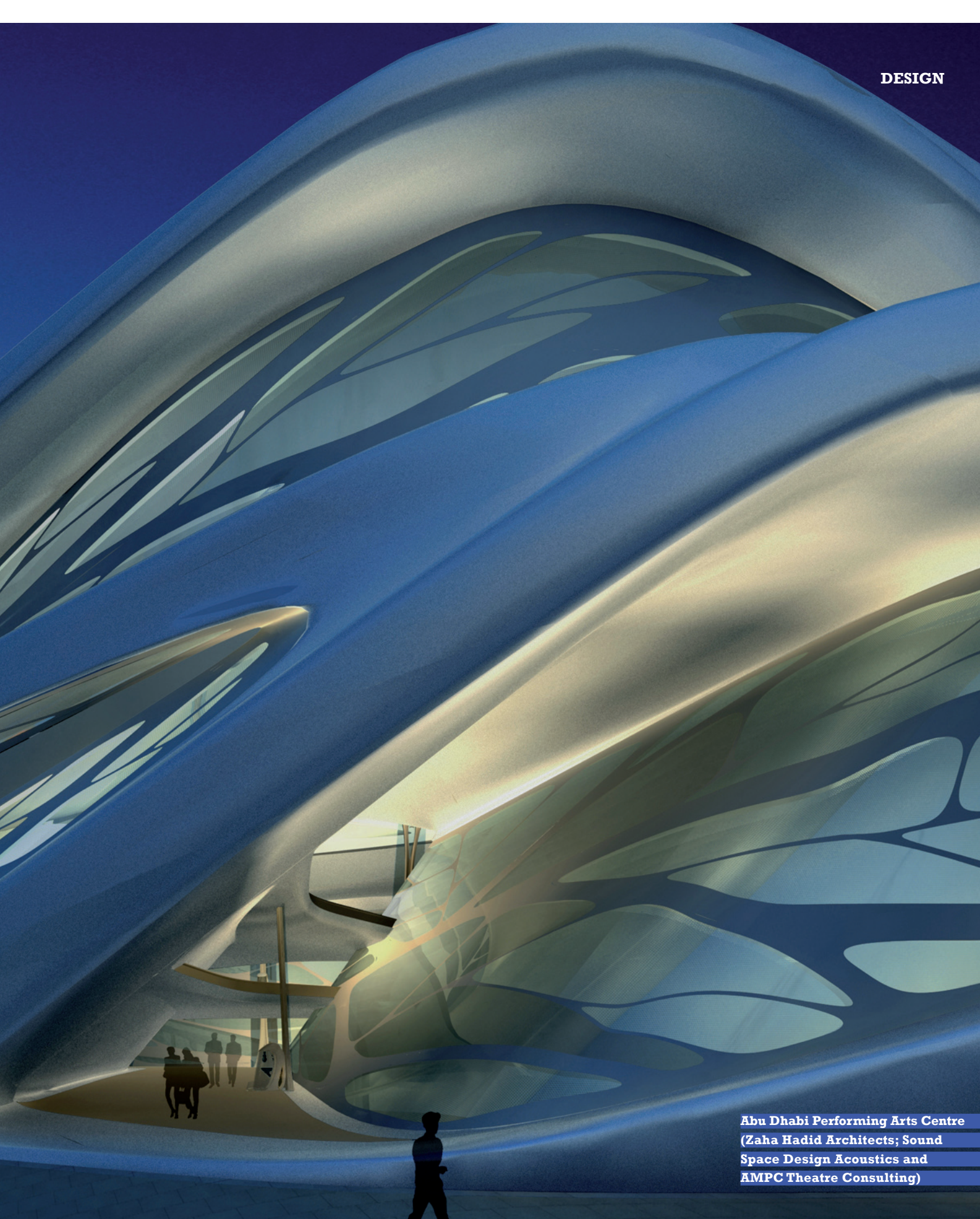
On day one, the creative life of the building is just beginning – the designers and directors of theatre, opera and multimedia events will react to the performance spaces and infrastructure that they find, and build upon them with their own

creative flare. So the artistic reputation of the building develops alongside its architectural one. People expect buildings to be successful on all fronts – uniquely located, instantly recognisable externally, architecturally stimulating, artistically bold, culturally broad-ranging, acoustically brilliant and physically comfortable. Buildings that are clear in their intentions often survive the activities of many generations because they have their own integrity.

Entering a building that has borne witness to the great voices of generations is to feel a part of the continuity of its history from the past into the future. People, especially young people, aspire to reach the heights of the giants that went before them, and this inspiration can be encouraged by a wonderful environment within which to relate to the performance.







**Abu Dhabi Performing Arts Centre**  
(Zaha Hadid Architects; Sound  
Space Design Acoustics and  
AMPC Theatre Consulting)

Zaha Hadid Architects



## DESIGN

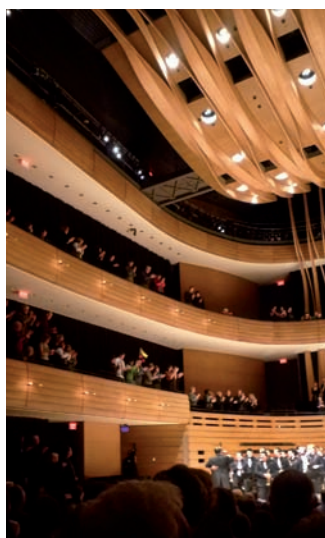
ANNE MINORS PERFORMANCE CONSULTANTS



Performance buildings cannot afford to be 'cast in stone' – they must also be able to adapt with the times. Over the past year, more and more artistic organisations have broadened their horizons beyond the audience within their own walls, to those sitting in other venues or standing or sitting outside, receiving live relays of opera or concerts. So in the summer of 2010, Glyndebourne Opera in the countryside of Sussex, UK, simulcast *The Rake's Progress* live to 5,000 people in the courtyard of Somerset House in central London; the Royal Opera House in Covent Garden, London, increased its audiences for some productions from 2,200 to 9,000 in a similar manner. The technology helps with the green credentials of arts buildings, enabling a broader reach and reducing the overall energy taken to get the audience to the live event.

Dallas Opera broadcast live on 22 October 2010 to the brand new Annette Strauss Artist Square, adding a possible 5,000 people to its 2,000-seat auditorium. The gathering nature of the hard and soft landscape of Artist Square is fundamental to the sense of occasion that is engendered between the performers on stage

**AMPC projects include Artist Square (Annette Strauss), Dallas Arts District, Texas, USA, with Foster + Partners Architects (above); and Koerner Hall in Toronto, Canada, with KPMB Architects (below)**



and the audience. The first live performers in September 2010 commented on the great rapport they felt with the audience, the fabulous view of the sunset that they had from the stage, and the magical quality of the setting.

Anne Minors Performance Consultants works with clients and architects, listening to their aspirations, so it can develop a brief and buildings to reflect their ambitions, planning for a foolproof future with performance spaces of character, not only fit for purpose, but also fitted-out for future flexibility.

Buildings where the artistic reputation of Anne Minors Performance Consultants projects is well-established include the Koerner Hall in Toronto, Canada; the Yehudi Menuhin School, Menuhin Hall in Surrey, UK; the BITE festival at London's Barbican Centre; and the Linbury Studio at Covent Garden. When complete, the Abu Dhabi Performing Arts Centre will also be honed to the aspirations of the client and the arts groups, and this will be reflected in the performance spaces within. ■

[www.ampcstudio.com](http://www.ampcstudio.com)



**AMPC** Anne Minors  
Performance  
Consultants

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www.ampcstudio.com



# Performing Worldwide

Anne Minors Performance Consultants are devoted to creating the best conditions for presenting and enjoying performances. Since 1996 the practice has been briefing, planning and equipping performance spaces, working with directors, performers and architects to explore and extend the boundaries of performance architecture.

*Annette Strauss Artist Square, Dallas Arts District, Texas. Architect: Foster + Partners*



# Rebirth of an icon

San Antonio's historic Municipal Auditorium is undergoing a revamp that will reflect the city's vibrant past, present and future



Plans for the layout of the Tobin Center





**Tobin Center for the  
Performing Arts and  
River Walk Plaza**

studio 216



## ARCHITECTURE

LMN ARCHITECTS



A custom wall system will  
enwrap the new building – its  
porous design transmits light  
at night, to stunning effect

Mark Twain once called San Antonio “one of America’s four unique cities”. Known as the gateway to Texas, San Antonio is associated with a rich mix of cultural, social, religious, political and historical events. Nearly 100 years ago when the city’s Municipal Auditorium was first built, it was among the first major civic structures; today this Spanish Colonial Revival-style gem is as prominent an icon for the city as the nearby Alamo.

However, as was the standard for cultural venues of the time, its only connection to the surrounding community was via a formal and imposing façade. It also wasn’t designed to relate to the river that flowed adjacent to the property, nor to any surrounding public space. The San Antonio River Walk, today among the state of Texas’s biggest tourist attractions, was not yet a reality. Over the last century, the city has experienced a significant evolution – both in terms of urban development and the cultural arts. The city recognised the need to respond to that evolution with a new performing arts centre that is evocative of its new urban condition and community significance.

The city’s goals for the new facility – to be called The Tobin Center for the Performing Arts – are to create a world-class permanent home to major performing arts organisations of San Antonio, to create a premier smaller venue to support the quality, accessibility, and visibility of other emerging arts organisation in the region, promulgate arts education, and integrate the centre into the cultural life of San Antonio, Bexar County and all of South Texas.

The design combines the renovation of portions of the existing Municipal Auditorium,

integrated with a new multipurpose performance hall to serve the needs of the symphony orchestra, opera, and ballet and a rich diversity of other programming. It embodies a series of interwoven juxtapositions inherent to the specific conditions of place: new and historic architecture; the River Walk and the urban core; bright sunlight and festive night time luminance; San Antonio’s cultural arts legacies of the past and dreams for the future. The result is a vibrant architectural experience rooted in the social, economic, environmental and cultural life of San Antonio.

### Urban elements

The existing facility sits at the intersection of several major urban elements in the downtown plan. To the south of the building, which is the main historic façade and entrance, and across the street is one of the major public open spaces within the city, a war memorial garden which links to the street grid of the urban core. On the building’s north side, which is the current location of the loading dock and service entrance, is the San Antonio River Walk. Typical to traditional auditorium design, there is no connection from this ‘backside’ to the public realm.

After the original facility was built, the city created the River Walk, a three-mile long network of walkways along the banks of the San Antonio River one story below the street level. Lined by extensive landscaped walkways and animated by bars, shops, restaurants and water taxis, the River Walk is an important part of the city’s urban fabric and a very active tourist attraction. Previously ending at the back of the Municipal Auditorium, the River Walk was recently extended north another couple of miles. The building’s location at the intersection of the old and new River Walk presents the opportunity

### Project details

- 1,750-seat multi-purpose hall with adjustable, world-class acoustics and movable floor system
- 27 luxury boxes and mezzanine and balcony seating
- 230-seat Studio Theater
- 600-person seating capacity outdoor performing arts plaza





to connect it to the River Walk and the river itself in new and exciting ways.

The river's organic geometry as it weaves through the city provides a welcome counterpoint to the street grid and the building's formal historic façade on the north side. The design responds to that geometry by shifting the orientation of the hall to interact with the bend in the river and create a new public open space at the riverside. The result is a building with two active faces – the historic urban side and the new river side – mirroring the evolution of the city and its cultural arts and honouring its history while laying the foundation for its future.

Daytime and evening along the River Walk offer distinct and equally dynamic experiences. Rows of cypresses and palm trees provide a cool canopy under which to stroll during the hot midday sun. The filtered light through the trees creates a dramatic natural effect during the day; at night the place takes on a theatrical atmosphere with electric lights on the trees and in landscaping. The design will echo this transformation through a custom wall system that enwraps the new part of the building against the riverside, providing a complimentary expression to the historic façade of the existing structure. Best described as a 'veil,' it is a porous and shimmering wall which is animated by textures of filtered light that pass through the surfaces. It envelops both solid wall and glazed surfaces of the primary building envelope, and at places overlaps itself. Like the River Walk, the building's exterior expression is animated by the quality of sunlight during the day, and at night is transformed via electric lights that exude a theatrical sensibility.

As street level is 20 feet higher than the river, a series of new outdoor public spaces will

gradually step down to the river, with a large terrace situated halfway between the river and street level. This terrace provides a substantial gathering area from which to view activities on the river, such as an annual riverboat parade; or function as a grandstand or outdoor performance venue.

### Flexible spaces

Part of addressing the unpredictable but inevitable future evolution of a city, in the design of public buildings, is creating flexible spaces. The main performance hall is a 'transformable room' with an innovative flooring system that allows for auditorium seating to shift from a standard sloped (or 'raked') configuration to a flat floor, and everything in between. The flexible system enables the space to serve a wide array of user groups, ranging from a large gala to an intimate opera performance.

Through multiple lighting systems, the room can also be transformed from a subdued, wood-toned colour scheme, to an intensely colourful room, with a multitude of settings in between. Lighting will be applied to surfaces behind perforated wood panels so that their appearance shifts – depending on colour, angle and light intensity – from deeply coloured, to luminous white, to a refined natural wood surface.

Occupying the gap between the new auditorium and the historic façade is the Studio Theatre, which will serve as a flexible space for events and performances, as well as creating a connection to the river, joining the interior activities with the exterior experience.

The new Tobin Center for the Performing Arts is set to open in spring 2014. ■

[www.lmnarchitects.com](http://www.lmnarchitects.com)

## Project team

**Architect:** LMN

**Associate architect:**

Marmon Mok

**Interior design and environmental**

**graphics:** Sussman/  
Prejza & Company

**Acoustical consultant:**  
Akustiks, LLC

**Theatre consultant:**  
Fisher Dachs Associates



# Shared values

The economic downturn demands greater collaboration between arts organisations, with highly flexible venues a priority going forward

There can be no doubt that the swingeing cuts to arts funding and the upcoming austerity programmes in not just Europe and America, but around the world, have caused plenty of worry to those who run performing arts programmes, and those of us who plan and build spaces for performance. Yet many of the more astute arts organisations pre-empted the current climate of cutbacks with plans over the last year or two to shore themselves up for the storms ahead.

Arup's Theatre Planning and Acoustics practice has noticed a number of good clients approaching development plans with marriage on their minds – plans which bring them together with other arts organisations to make sense of the challenges ahead in the market, and to better utilise their facilities effectively while the philanthropic and audience communities recover.

Such marriages – or at least, co-habitations – are not new. A lot of shoe leather was left on the streets of Greater Philadelphia as David Taylor and architect Crystal Son visited theatre



and dance companies, pocket opera producers and chamber music ensembles, tucked away in their shop fronts and non-descript offices across the city. Their task was to broker a marriage of companies as residents for the then Regional Performing Arts Center, what eventually became the bustling Kimmel Center on Avenue of the Arts.

But such residencies, with shared production facilities, but without offices or home bases in the building are outmoded in the new 'moving in together' climate of this time of arts frugality. Arup's award winning Jerome Robbins Theatre, created out of the old shell on the third floor of 37Arts in Manhattan, was originally commissioned by Mikhail Baryshnikov as a new home for his company as a presenting and producing house for dance. But a little way into the design process Baryshnikov summoned Arup's theatre planner to his office and told Taylor that he had inked a deal for the 'dance' theatre to also be a new home for The Wooster Group, the enfant terrible of American technical theatre companies.

A high brand dance company and a crazy physical theatre company seemed like a clash on





Pics: Alexander Severin/RAZUMVE

paper, but they fit in the new theatre perfectly. The unique motorised rigging system, the thorough installation of infrastructure for sound, video and lighting, and a large control cockpit in the very middle of the orchestra seating provide a space that is elegant and comfortable for Baryshnikov and his dancers, and technically satisfying for Liz LeCompte and the exacting Wooster Group. The two residents in the Jerome Robbins Theatre not only co-habit, but do so synergistically.

As theatre designer, Arup's Jim Niesel looked boldly to Alexander technique form bench seating as a means of giving a comfortable, flexible audience experience with good dance sightlines focus for drama. A simple seat choice, as an outcome of considerable research and development, has re-defined how audiences in New York can hear, see and sit for music, dance and theatre.

Stanford Makishi, executive director of Baryshnikov Arts Center, says that The Wooster Group "represents the kind of creative thinking and exploration the BAC is interested in". This exploration pushes the envelope for the technical

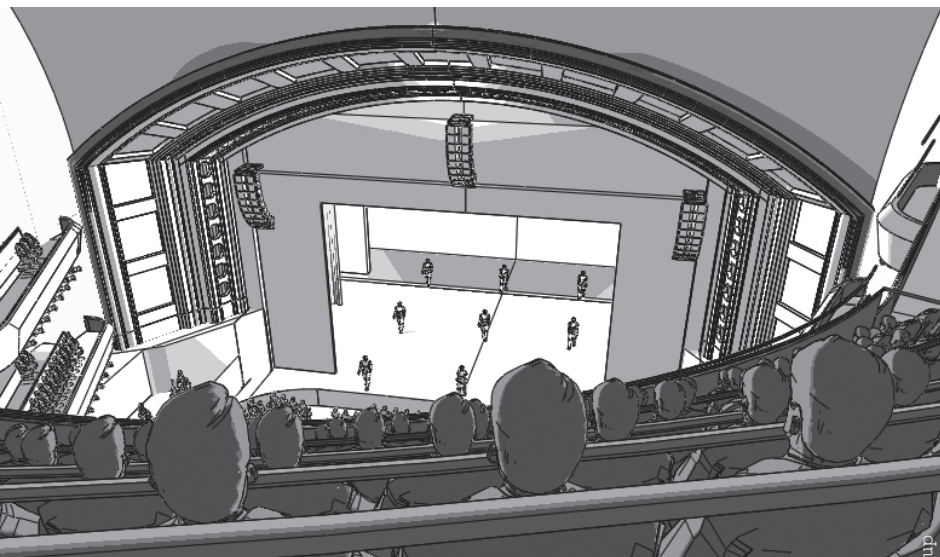
resources, but draws together a loyal audience to a broader range of events in the new theatre.

Despite the challenging market in North America, such synergistic relationships are also increasingly present in other arts markets around the world. In vibrant Singapore, the National Arts Council has not only engaged Arup as theatre designers and acousticians to design the bold new renovation of the Victoria Theatre and Victoria Concert Hall, but, with the return home of the Singapore Symphony to Vic Halls, the Esplanade is exploring the active management of the venues as part of a wider portfolio in Singapore's thriving cultural scene. Such synergistic associations encourage new thinking in the planning of arts facilities, and Arup is well placed to develop the designs for the sympathetic renovation of the concert hall, and a bold and new theatre within the historic shell of the Victoria Theatre for theatrical and acoustic excellence.

Back in New York, the ongoing plans to develop a choreographic centre in the Brooklyn Academy of Music Cultural District have challenged the Arup team with a coalition

**Interior shots of Arup's  
award-winning Jerome  
Robbins Theatre in Manhattan**





**Arup is redesigning the  
Northrop Auditorium in  
Minneapolis**

of dance and musical theatre with Danspace Project (New York's leading dance aggregator, which presents new work in dance, supports a diverse range of international choreographers in developing new work, encourages experimentation, and connects artists to audiences) taking 651Arts under its wing in the new Brooklyn Arts Tower designed by the darlings of cultural architecture, Snohetta and MDA.

Judy Hussie-Taylor, executive director of Danspace Project, and brain behind their CW2 model (Choreographic Center Without Walls) says: "Danspace is interested in making work happen in 'space' – a dynamic constellation of people, resources and geography. The relationship with 651Arts enabled Danspace to re-examine our use of space, our opportunities for mixing audiences and for sharing administrative and operational responsibilities. For our building at BAM it led to Arup thinking about movement in terms of sound, and sound in terms of space."

In chilly Minneapolis, Arup is re-imagining the largest theatre venue, the Northrop Auditorium, to re-engage it with the avid community of dance and music goers. Acousticians Raj Patel and Joshua Cushner have embraced not only the broad range of future uses of the reconfigured auditorium, which has tightened from a sprawling 4,800 seats to a more intimate and engaging 2,800 seats, but also the

exploitation of the newly found public space in the historic building for academic, social and technological use from entities such as the Innovation by Design group and programming in the broad lobbies and exterior of the building.

Vice president for Scholarly and Cultural Affairs at the University of Minnesota, Steve Rosenstone says: "Northrop is one of those rare opportunities in which a single project can have such a far-reaching and lasting impact not only on students, faculty, and the vitality of campus life, but on the contributions that the University of Minnesota makes to the quality of civic and cultural life of our state. It is a powerful example of the new ways we should be thinking about configuring university resources to better serve students, advance breakthrough discoveries, and work in partnership with educational, cultural, and civic organisations across our state."

### **Diverse audiences**

Since the auditorium has increased transparency in HGA and Arup's design, the other residents in the building are connected to, and thrive because of the re-animated operations of the New Northrop. Project director David Taylor says: "Our client's brief was to move the Northrop from being 'a rock in the stream' to drawing diverse audiences, artists and participants into a strong relationship with the groups in the building. Our design uses that as the starting point, and success will change the cultural map in the Twin Cities."

As well as synergies within the venues, a productive relationship with the environs can also be a symptom of a thriving cultural investment within the social infrastructure of a community. Live Nation's Grand Canal Square thrives because of what CEO Mike Adamson calls the "passionate embrace of Joe O'Reilly's Chartered Land development around Grand Canal Square". Here, as in Brooklyn and Midtown Manhattan, learning to live together has led to more than the sum of the parts for cultural developments, and Arup's cultural planners are at the heart of such developments as drivers of social infrastructure. ■

[www.arup.com](http://www.arup.com)



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INTERNATIONAL SOCIETY FOR THE PERFORMING ARTS







# Image makeover

Martinez+Johnson has used its expertise to make a number of venues built in the 1960s fit for modern-day productions

**Above: Mahalia Jackson**  
**Top right: Planet Hollywood**

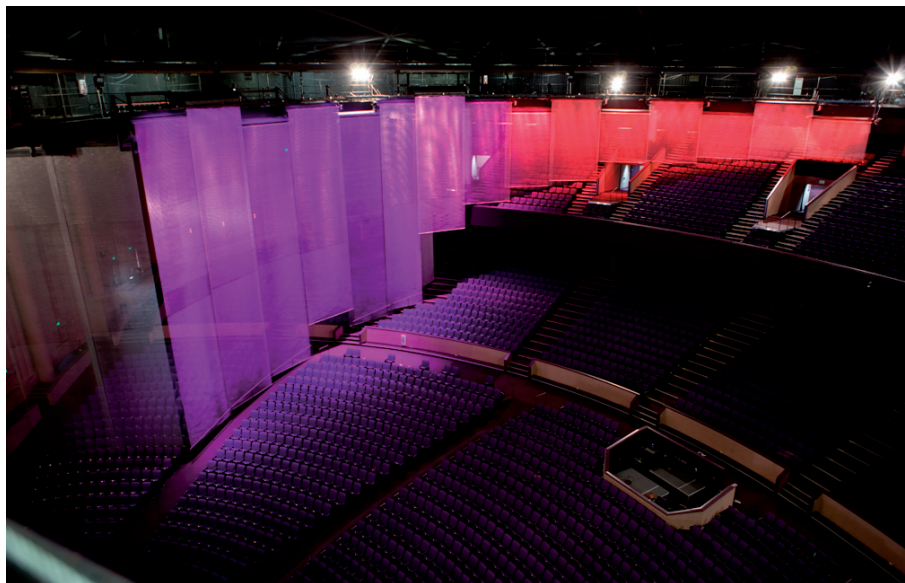
In cities all around the world, venues built in the 1960s and 1970s are nearing the end of their useful lives. Many of these structures played major redevelopment roles in their cities and communities, and are now facing the challenges of obsolescence with the emergence of newer performing arts venues. Generally these structures were designed for a specific use and are not suited to multi-use programmes, while the public's appetite for pre- and post-performance activities and amenities requires a new attitude towards these spaces.

To address these ever-changing design parameters and expand revenue opportunities for aging performance venues, Martinez+Johnson Architecture has used its extensive experience in

restoring turn-of-the-century historic theatres throughout North America to create a new model for the revitalisation of landmark theatres from the latter half of the 20<sup>th</sup> century.

The Mahalia Jackson Center for Performing Arts in New Orleans was devastated by hurricane Katrina, denying New Orleans of any theatre facilities, so Martinez+Johnson used the opportunity to develop a programme to bring the venue up to date. All public areas were redesigned with an emphasis on comfort and ease-of-use, and worn finishes were replaced to create a warm and welcoming environment reflective of the open, hospitable culture of the city and its citizens. A new seating plan in the audience chamber improved audience circulation and access, while newly cast decorative lighting





was designed to reinforce the strong visual and physical connection of the primary lobby spaces to the surrounding Louis Armstrong Park, thus enhancing the centre's cultural and social ties to the city proper.

Meanwhile, at the Planet Hollywood Theatre for the Performing Arts in Las Vegas, the 7,500-seat arena sought a solution to expanding its presentation capabilities and reducing the capacity to 3,000 seats to accommodate touring Broadway shows – a level of flexibility that had never been envisioned for the venue. Significant structural obstacles stood in the way of achieving this goal. In response to this challenge, Martinez+Johnson devised a series of mechanised architectural metal mesh curtains to enclose the smaller number of seats and

**The renovated interior of the David H. Koch Theater, home of the New York City Ballet and New York City Opera**



visually reduce the size of the arena to a theatre. To support the tall mesh dividers, structurally reinforced girders were installed around the dome of the arena. Hung from these girders, the metal mesh dividers can be remotely raised and lowered in a matter of hours depending on show requirements.

The David H. Koch Theater (formerly the New York State Theater), home of the New York City Ballet and New York City Opera on the Lincoln Center campus, was renovated between 2007 and 2009. The facility, nearing 45 years of use, also needed improvements to support the ever-changing needs of production. Stewart Jones, currently a principal at Martinez+Johnson, led the renovation team for JCJ Architecture



## ARCHITECTURE

MARTINEZ & JOHNSON



The main room at the Koch Theater (right) and the hi-tech control room (above)



Improvements to the Koch Theater included the replacement of the 1960s vintage lighting and dimming systems, as well as a complete reconfiguration of the orchestra pit and seating. The new pit brings more warmth to the orchestral performance, while also providing adjustable acoustics depending on orchestral size and type. The removal of many sound-absorbing surfaces in the auditorium improved the room's overall reverberation, and the reshaping of the auditorium sidewalls near the proscenium allowed the sound to be properly reflected back into the seating areas.

The original fixed 'bathtub' orchestra pit was replaced with an operable lift system so that the pit could be adjusted both vertically and horizontally. The vertical movement allows the pit to travel up to stage level, while the horizontal expansion converts one row of seats into pit use for the largest orchestral productions. New centre aisles in the auditorium orchestra replaced the continental-style seating layout, and this new layout generated row lengths up to 45 chairs and divided the seating body into three sections by introducing two 'centre' aisles. This more user-friendly layout also reduces the visual size of the auditorium, therefore enhancing the actor/audience relationship.

The previous auditorium's seating lacked quality and comfort, but the new ebony seats have solid wood backs and bottoms for extra comfort. The burgundy chairs have been pre-wired in anticipation of the future installation of a seatback titling system, and the supporting bracket for the screens fits easily into the chair. With sustainability in mind, the chairs are manufactured less than 500 miles away and made using eco-friendly materials.

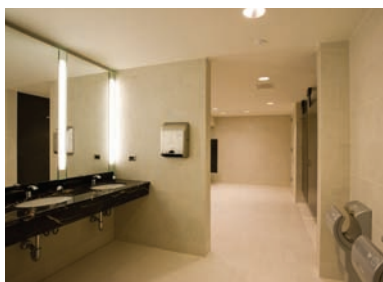
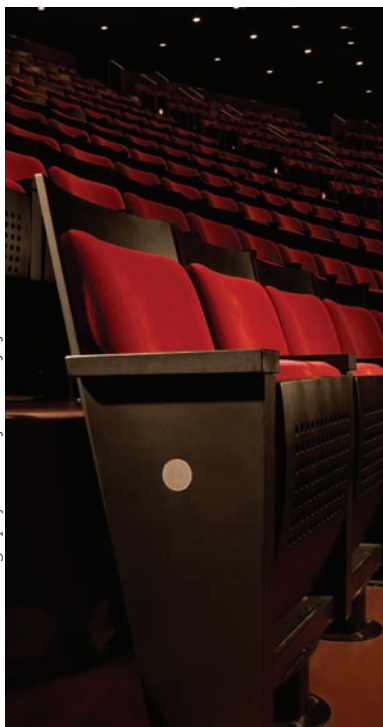
The inner lobbies (the spaces that connect the auditorium to the grand promenade) were originally treated as transitory and purposefully made dark, but the new design adds scale and warmth with a subtle pattern in the carpet, extracted from the gold leaf rings in the auditorium. New wall coverings contain a slight hint of gold thread in a linen-like weave, picking up on the gold leaf promenade ceiling. The original restrooms almost seemed an afterthought, whereas the new ones complete the renovation, including revised layouts to improve circulation, extra fixtures and fittings, and accessibility for the disabled.

### Control room

A new control room for a media/broadcast facility lies directly under the rear of the orchestra with sophisticated technology for recording and broadcasting productions. Fiber-optic wiring connects up numerous camera positions and video monitors throughout the building, resulting in the ability to better inform the audience both within and outside the venue, an important tool for attracting new generations of patrons.

These examples of 1960s auditoria demonstrate the problems faced by ageing venues. The challenge faced by firms like Martinez+Johnson today is to anticipate the needs for new artistic visions and their increasingly cross-disciplinary work, while at the same time, accommodating customers' demands for improved amenities and services. Meeting this challenge will provide new opportunities to venues for increased sources of revenue and audience building programmes. ■

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## DESIGN

JOHN SERGIO FISHER

# Three in one



**The centre incorporates a black box (above), outdoor amphitheatre (below), and proscenium theatre (right)**

**T**he recently completed Las Positas College Center for the Arts in Livermore, California, USA, contains a 550-seat proscenium theatre and a 150-seat flexible black box theatre within a 5,000m<sup>2</sup> complex for the college's theatre arts, music and speech programmes. In addition, the dressing rooms, green room and shops feed the stage of an adjacent 1,500-seat open amphitheatre, via a tunnel.

The audience chamber is divided by a cross aisle with 190 seats in the orchestra

section and 360 seats in the parterre and surrounding boxes. Proscenium arch trementors can vary the opening from 10m for plays to 15m for orchestra, choir and dance, and somewhere in between for musical theatre, convocation and other assembly uses.

There are no catwalks or ducts in the exposed ceiling of the audience chamber, which is painted black. The ante proscenium flexible lighting positions are on a large tension grid, which extends from just past the back of the cross aisle to a fore-stage acoustical reflector. The heating, ventilation and air conditioning is an upfeed system from a plenum below the seating, which is a much quieter and efficient method for conditioning the space.

Acoustic draperies, which surround the tension grid and hug the side wall technical galleries along with absorption/reflection flip panels against the audience chamber rear walls, allow for variable reverberation times, from one second for drama productions to 1.7 seconds for the symphonic orchestra.

The coordination of the acoustic consultant with the theatre consultant and the architect was an efficient process, since they are all divisions of the same firm – John Sergio Fisher & Associates, which has offices in Los Angeles and San Francisco, USA.







The 12 x 27m stage has a conventional counterweight flying system with four electric trusses and the flying ceiling units of an orchestra shell. There is a gridiron with loft backs underhung from the roof beams, while a rear projection bay stores the orchestra shell towers. The orchestra pit has a lift in three positions – the pit, at seating level for additional seats and at the stage for a soft thrust. The pit level connects to a trap room below the stage traps.

The 150-seat black box theatre has a unique flexible floor panel system that has only been used a couple of times before in the USA. It has a pneumatic scissor lift manufactured in Germany and distributed from London, UK, and a crew of two can transform the floor from dead level to up-and-down risers for theatre-in-the-round, three-quarter-round, traverse and end stage modes in about 45 minutes.

Meanwhile the stepped grass amphitheatre has a large open stage and is completely wheelchair accessible – it is even accessible to the large mower machines that keep the grass trim.

When asked his opinion of the centre, the dean of the college rated this LEED Silver-project as a “beautifully planned space” and added that “the amphitheatre was pretty spectacular, too”. ■

[www.jsfarchs.com](http://www.jsfarchs.com)





# Bonding exercise

An inspired team-building idea proved invaluable to the success of The Royal Shakespeare Theatre project

All the best projects have a moment – a moment when you just ‘get it’. So there we were at the Mace ‘launch workshop’, a workshop aimed at kick-starting the norming, forming, storming, performing dynamic and encouraging a high-performing project team. At best, we were a loose assemblage of shy client, builder and designer types, when Andy Hales of Charcoal Blue Theatre Consultants gave us the ultimate insight into what this Royal Shakespeare Theatre thrust stage project was all about.

In best primary school fashion, he made us line up and then perform – initially to a static line of our emerging team members. A line stood in front of us like in a traditional theatre. Then, we were immersed in the all-enveloping, nowhere-to-hide sensation of performing to an audience on three sides: a thrust stage experience. How different was that? How different did that make our shared understanding of the project we were embarking upon? How different did it encourage us all to feel? And how different did we all ultimately perform?

A team was formed, a team that didn’t need to hide, and a team that to a person became enveloped in producing the world’s best theatre for the performance of Shakespeare. A construction management approach had been recommended by project manager DJ Deloitte as the project implementation strategy in recognition of the inherent complexities associated with the remodelling of Elizabeth Shaw’s listed 1930s theatre.

Mace worked hard to secure the appointment as construction manager in December 2006 and put together a team that relished the challenge inherent in remodelling the 1930s theatre space into a thrust stage auditorium, adding a 36m-

high tapering observation tower and digging an 8m-deep basement right next to the river Avon. These were just three of the technical challenges – and all this for the Royal Shakespeare Company, a demanding client if ever there was one.

The Bennetts Associates design demanded the blending of modern and traditional materials and construction techniques; you won’t find too many 36m-high load-bearing brick towers tapering in all directions built in the past 100 years. Mace worked with specialists from its supply chain to blend the best of modern design and construction techniques with the very best of traditional trade skills. A great example of this blend is the observation tower, which combined eight months of bricklaying work to produce some superb tapering brickwork, where every course of bricks was different. This brick tower was then surmounted by the observation ‘lantern’, which was pre-assembled at ground level and then lifted into place in a single operation.

And by the way, the bricklayers adored this job, a job that made them really think about every brick they laid, every day for eight months – not just another brick in the wall.

Mace worked with Bennetts and Buro Happold, the structural and services engineers, to optimise the benefits of off-site assembly for key elements of the building wherever possible, while sourcing increasingly rare traditional skills for the specialist and heritage works.

Mace completed the Royal Shakespeare Theatre Project on the day it signed up to in 2006 and within the original budget. An unprecedented achievement and in no small way a result of the team that grew out of that launch workshop and that thrust stage experience. We all ‘got it!’ ■

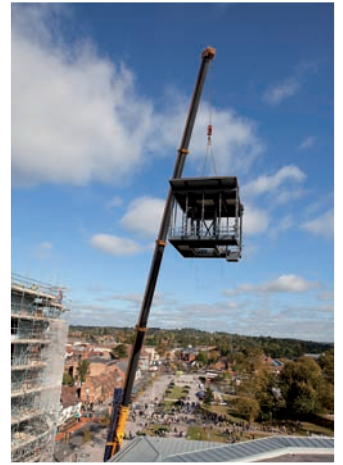
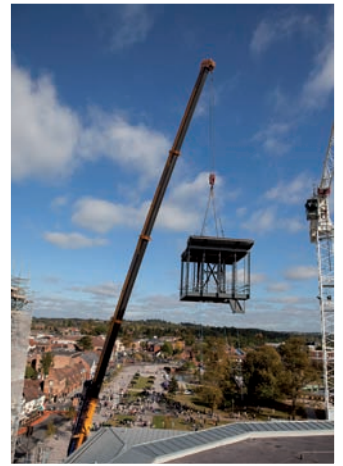
[www.macegroup.com](http://www.macegroup.com)







The observation 'lantern' was pre-assembled at ground level and then lifted into place in a single operation





# Media frenzy

Theatre Projects has been busy furnishing performing arts centres with the latest technology and social media

**Clockwise from top: New World Symphony's performance space; Cleveland Institute of Music's weekend guitar master class; Cleveland Institute of Music's music in movies**

**T**hroughout the 20<sup>th</sup> century, radio, records, film, TV and the web have changed how we experience the performing arts. Before these inventions, to enjoy music, drama, opera and dance, audiences had to be in the same space as the performer.

However, something new and exciting has happened in the last decade – people are still watching TV (both on television sets and streaming through their computers), but they're posting on Facebook and Twitter and blogging about what they experienced. So what does this recent explosion of social media and technology mean for the live performing arts?

Theatre Projects has been building broadcast capability into theatres for the past 30 years, allowing its clients to broadcast their performances. But these technologies have been expensive, and out of reach for many arts organisations and there have been concerns about the quality of the reproduction and the integrity of the experience. In the past few years, however, there have been two significant changes that are creating a whole new world of opportunities for the live performing arts. The first is technology – vastly improved video and audio reproduction quality combined with broadband capability and developments like Internet2 allow for unprecedented streaming and delivery of information. The second is cost – as these technologies become more mainstream and accessible, they become more affordable.

Live performance can now be shared and the arts community – especially arts educators – is embracing the change wholeheartedly. As the arts integrate new technologies into their creative work, they're reaching their students and

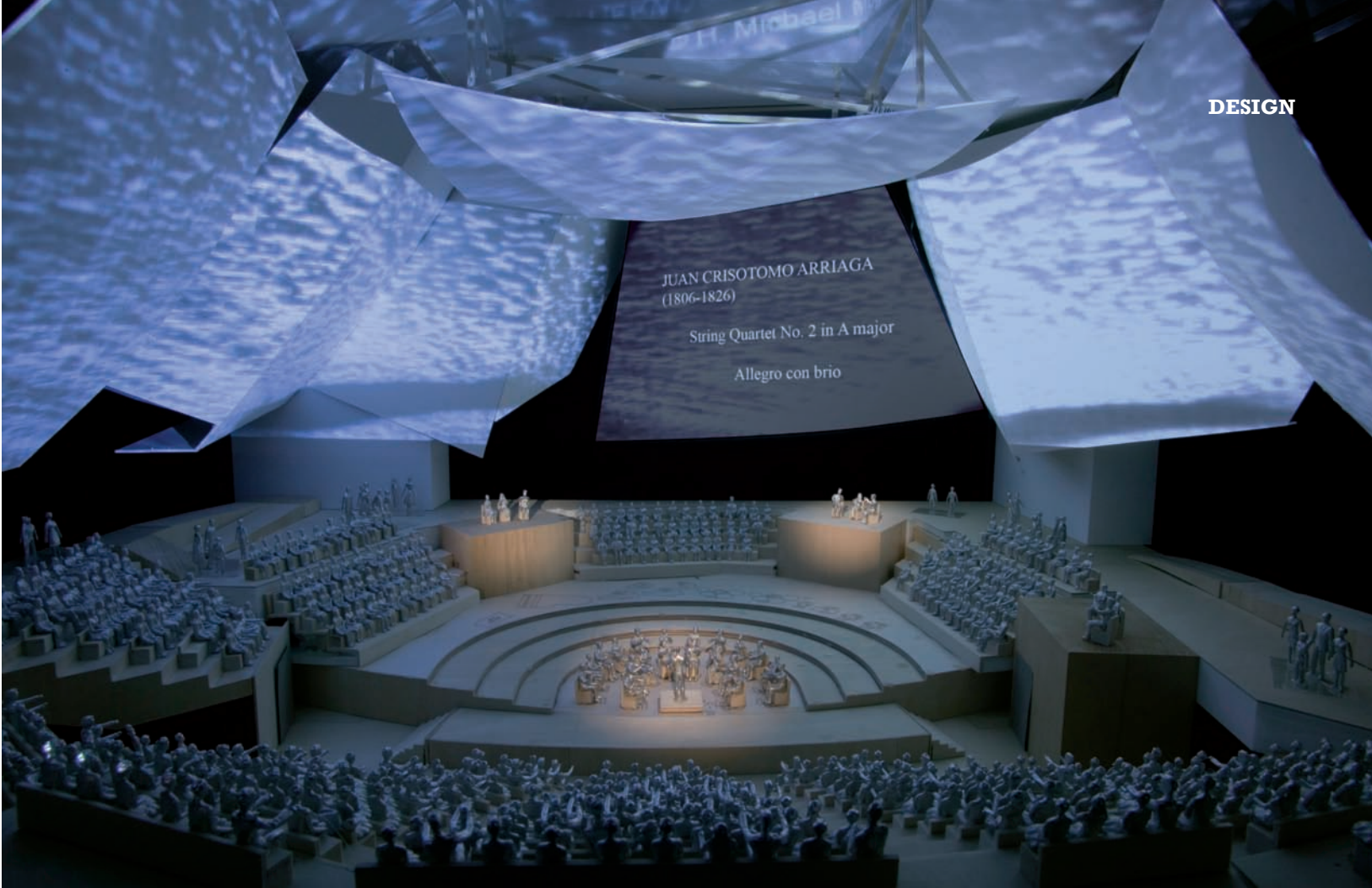
audiences in ways no one imagined even a few years ago. Clients around the world are asking for spaces that support both live and long-distance learning and performance and incorporate new technologies in flexible, robust ways. Theatre Projects is rising to this challenge, adding layers to its services and finding new ways to design rooms and equipment that meet today's needs and tomorrow's dreams.

## Musical exchange

One of Theatre Projects' clients is New World Symphony (NWS), a pioneer in distance learning and musical exchange. Theatre Projects is working with Gehry Partners and Nagata Acoustics on a new building for NWS in Miami Beach, Florida which will open in January. The facility will be one of the most advanced learning centres for music ever created. As theatre designer and planner for this project, Theatre Projects integrated Internet2 technology, advanced audio systems, and state-of-the-art video projection throughout the facility, as part of the programming for the building. It helped create a room design that supports live performance, nearly 360° projection, and worldwide connectivity, allowing NWS to push the boundaries of teaching, learning and performing.

For example, flexibility was provided with the design of a 10-lift system to transform the concert platform to accommodate 14 performance configurations. An extra-large control room accommodates the broadcast and video infrastructure, and there are video and audio suites for the staff. The infrastructure design also included seamless cable pathways to allow for external broadcast capabilities without the cables running through the auditorium.









**The control room at the  
Cleveland Institute of Music**

NWS already uses social networking media and technology as a springboard to open the entire world of music to its New World Fellows and vice versa. Artists and teachers whose commitments don't allow for visits to Miami can lead real-time master-classes. Composers a continent away can 'sit in' on rehearsals of their work or talk to audiences before a performance. Fellows can share their virtuosity with young aspiring musicians in schools and conservatories from China to North Carolina.

On a smaller, but equally vibrant project, Theatre Projects took on the design and planning of a new addition to the Cleveland Institute of Music (CIM) in Cleveland, Ohio. Working with architect Charles T. Young Architects and acoustician Akustiks, the result includes a 250-seat recital hall and an electronic media/distance learning centre. Both the recital hall and the distance learning studios support live broadcasts, allowing CIM to provide quality musical training and performance to a worldwide audience.

"The main challenge in using distance learning at the conservatory level was being able to accurately reproduce the audio," says Greg Howe, director of Distance Learning at CIM. "Only recently has the available audio technology caught up with the video technology, allowing us to expand our programmes."

Using videoconference technologies, the Distance Learning Department is able to train offsite music students ranging from primary school to conservatory level, facilitating connections to schools all over the world. The reach is broad, with a particularly high level of responses from New York and Alberta, Canada.

In addition, the Distance Learning Department provides professional musicians around the world with access to upper-level master-classes, seminars and performances. CIM also partners with other schools and advanced training programmes, including NWS. Just recently, Michael Tilson Thomas coached a student conductor of a small chamber orchestra at CIM from his office in Miami Beach.

These two institutions have forged a creative bond allowing musicians to teach long-distance while performing professionally. Many CIM faculty members perform with the Cleveland Orchestra, which is resident at the Adrienne Arsht Center for the Performing Arts of Miami-Dade County in Florida, and are also adjunct faculty at NWS. When CIM faculty members are in Miami performing, they can give private lessons to their CIM students via video conferencing. When they're in Cleveland, they can train the NWS Fellows in Miami the same way.

### **Social media**

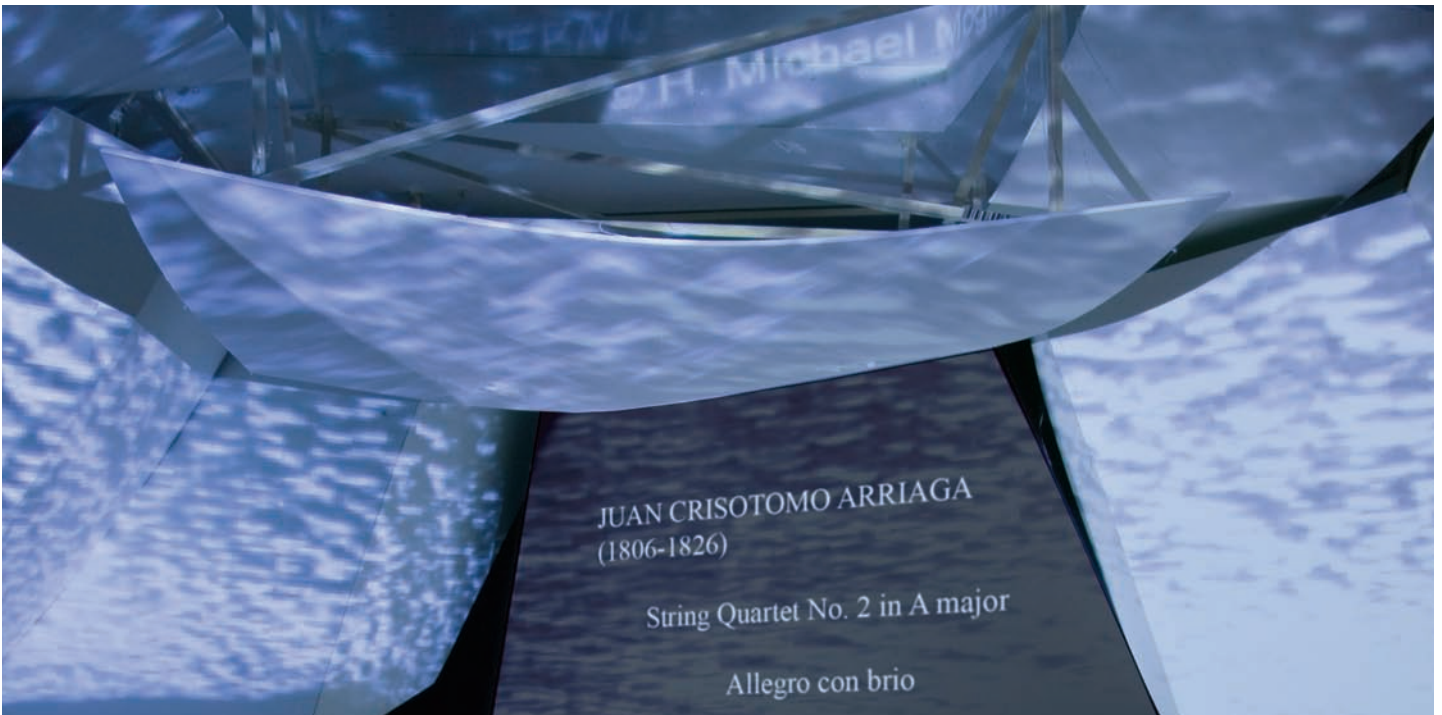
Keeping ahead of the curve in social media, CIM is on Facebook, Twitter, Instant Encore and Vimeo, although the school continues to grapple with deciding which new social tools are here to stay and which are fads. School administrators and faculty are in constant conversation about how much of their unique, creative work should be "out there" beyond the school's (and the artists') influence and control. Regardless, CIM considers the Distance Learning Program a fantastic success and a great recruiting tool.

Faculty members at both institutions no longer have to choose between a professional performance career and a teaching career based on geography – and students gain extraordinary training with actively performing professionals.

Not knowing exactly what the future holds, we don't know how far the combination of technology and artistic creativity will go. But at Theatre Projects, venues are designed to be both flexible and expandable for clients – creating spaces that enhance the great ideas they've already had, and which are ready to support the great ideas that they haven't thought of yet. ■

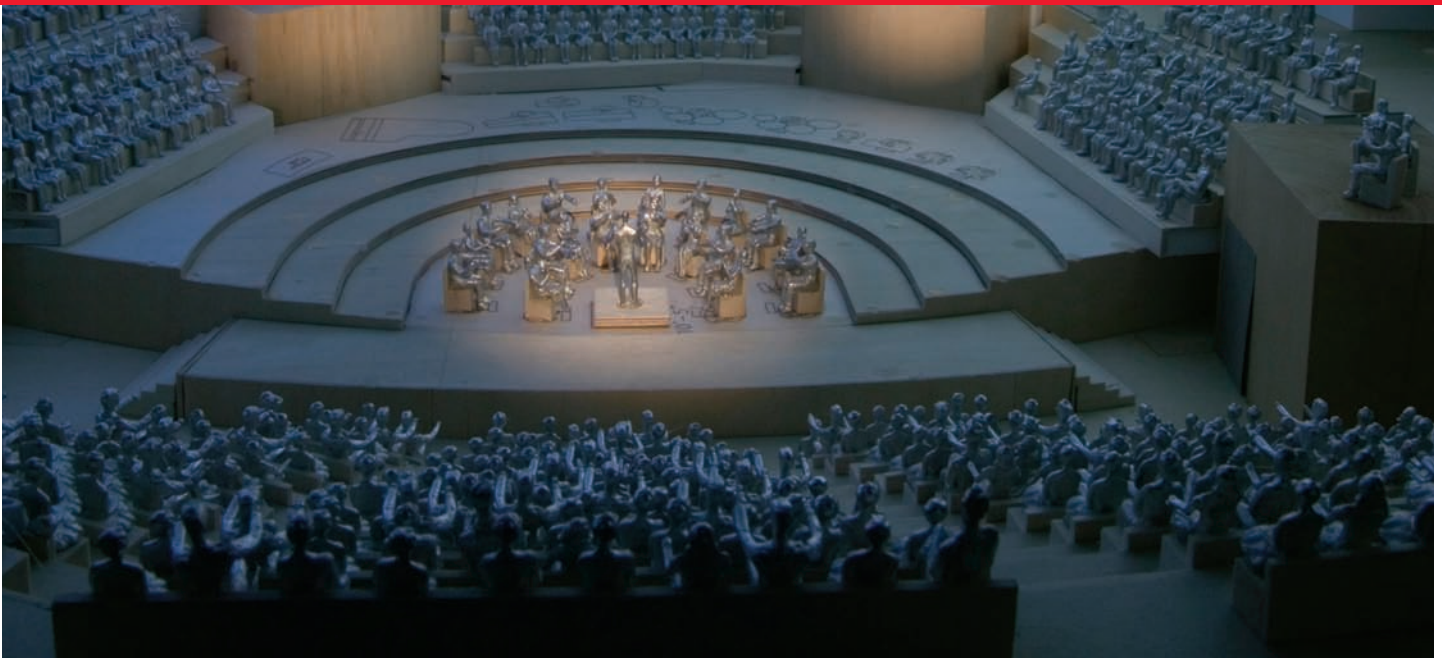
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# Acoustic revivals

Auditorium renovation projects in the United States and Hong Kong showcase the stunning visual and aural impact of new full-stage acoustic shells

When it opened in 1928, the historic Carpenter Theatre in Richmond, Virginia, USA featured interior architecture in a Spanish baroque style. After renovation and restoration, the Carpenter reopened in 2009. While the auditorium's physical dimensions were kept, with nearly 1,800 seats, the Carpenter's vaudeville-era stage house was replaced: its depth and width were almost doubled, and the grid was raised to over 21m. Other updates included an enlarged orchestra pit, new 80-line manual counterweight rigging system and Wenger acoustical shell provided as part of a complete stage equipment package supplied by Texas Scenic Company.

"We wanted a memorable acoustic shell," recalls Bruce Herrmann, AIA, director at Wilson Butler Architects of Boston, Massachusetts. "We had worked with acoustic equipment specialist Wenger on other unusual shells over the past 10 years and knew they would get into the spirit of what we were trying to accomplish. They roll up their sleeves and offer solutions – even when we're asking for something new."

The Carpenter's interior sidewalls resemble building façades, complete with balconies, statues and inset niches glowing blue from the 'twilight' lighting behind them. To continue the feeling of a skyline's depth, Wenger sandwiched together two of its Diva full-stage acoustic shell wall panels. The 'blue sky' Diva panel at the back recedes behind the 'city wall' Diva panel in front.

Wenger constructed niche boxes, or insets, in six of the 11 Diva wall towers, inspired by the niches in the auditorium's walls and

featuring hidden lights to create a bluish, twilight glow. One of Wenger's biggest manufacturing challenges was cutting these niches in the wall towers and unusual 'skyline' shapes along the shell's top edges.

Herrmann and Wenger worked together to create the Diva's unusual shapes and angles. "If Wenger couldn't cut the exact shape or angle that I was looking for, they would send me a sample approximating it," he recalls. "Wenger was great to work with and the result turned out really well."

"All the interior architectural elements are intended to enhance the temporary suspension of disbelief – imagine you are in a plaza under the evening sky," says Herrmann. This visual treatment was also carried through to the acoustic shell, which features a vibrant colour scheme painted on by EverGreene Architectural Arts; they also painted the theatre's interior. The theatre design consultant was Theatre Projects; the acoustic consultant was JaffeHolden.

Herrmann believes that if orchestra shells are really done well, the audience members feel like they're in the same room with the orchestra. Aurally, shells strive to join the stage house and audience chamber into one acoustic space, for the benefit of both audience and performers.

"The Diva shell helps us create the best acoustic environment for the musicians," says Laura Bordner Adams, director of orchestral operations with the Richmond Symphony Orchestra. "Musicians are now able to hear each other, which enables them to play together as a much more unified group."

Technical director Steve Sweet says the Carpenter's crew can deploy the shell in less than



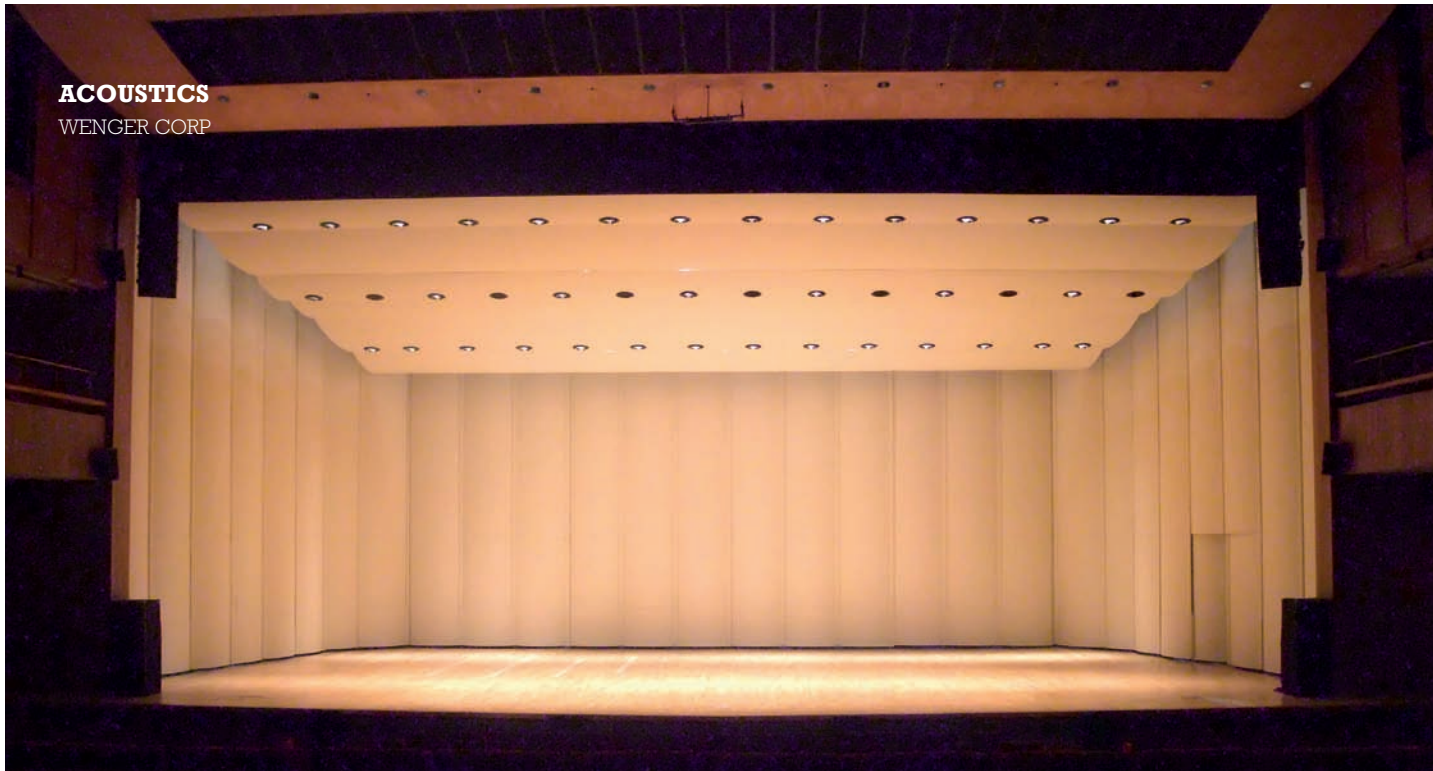
The main stage at the  
Carpenter Theatre





Robert Benson Photography





**Sha Tin Town Hall's new Diva  
Shell comprises 12 wall towers  
and three ceiling panels**

two hours and strike it in under one. For storage, he likes how the Diva towers nest together and stack fairly tight.

The Carpenter Theatre beautifully blends the new and old – recalling a golden past while adding the Diva shell and other enhancements for the future. “Some people who saw shows here as kids are now bringing their grandchildren,” says Herrmann. “Memorable buildings have the potential to be enjoyed by generations who haven’t even been born yet. What a great legacy to leave behind.”

**Sha Tin Town Hall, Hong Kong**

Halfway around the world in Asia, the tremendous growth in performing arts facilities is laying the foundation for new traditions of excellence. Recognised as one of the Hong Kong’s finest performing arts centres, Sha Tin Town Hall features a wide range of performance and exhibition venues. Its centrepiece is a 1,372-seat auditorium for dance, drama and music.

To improve this venue’s acoustics and flexibility for different musical performances, Wenger recently installed a Diva acoustic shell, replacing an older shell. The inaugural performance in February 2010 was in conjunction with the Chinese New Year; the facility opened in 1987.

This new shell is comprised of 12 wall towers and three rows of ceiling panels with 66 built-in lights and a fire-retardant painted finish.

Wenger’s distributor partner in Hong Kong, Claridge House, negotiated and communicated all the project details; Francis Fok is sales

manager. Wenger provided two different shell configuration options to accommodate various performing groups or solo performers. Wenger installers marked the stage accordingly, allowing the technical staff to easily move the towers into the correct position.

Facilitating this movement is an Air Transporter, which supports a majority of the tower weight on a cushion of air. The custom-made wooden stage floor of the Sha Tin Town Hall, designed to provide resilience for dance performances, had been damaged by the previous shell so the Diva shell’s improved mobility and setup were key advantages. Diva towers also feature soft rear casters to help minimise floor damage and adjustable front levellers to align adjacent wall towers over any floor irregularities.

“This Diva shell’s lightweight aluminium structure and honeycomb panels weigh significantly less than the steel-and-wood construction of the previous shell,” explains Nancy Wagner, director, international sales at Wenger. “It gives a new, more trendy face to the auditorium,” adds Andy Tsui, the resident technical manager in the Culture Services Office (New Territories East) of Sha Tin Town Hall. “It is pleasant-looking, well-lit and much brighter.”

Along with acoustic shells, Wenger outfits performing arts facilities around the world with a wide range of support equipment including staging platforms, choral risers, music stands, music posture chairs and storage cabinets. ■

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# Square reborn

Annette Strauss Artist Square in Dallas combines superb opera acoustics with a high-quality sound reinforcement system

Plans for the layout of the  
Dallas Arts District (this page);  
Artist Square (top right);  
computer model of sound  
propagation in Artist Square  
and towards Meyerson  
(bottom right)

This year, the Dallas Arts District has added an outdoor venue to the recently completed Winspear Opera House and Wyly Theatre (described in the 2009 issue of *Auditoria*). Annette Strauss Artist Square replaces the ad-hoc Artist Square stage that had been displaced by the building of the Winspear and complements the existing Meyerson Concert Hall and Booker T Washington High School. This continues the progress of the Dallas Arts District into one of the world's most complete and encompassing urban arts developments.

The City of Dallas wanted to keep Artist Square within the Dallas Centre for the Performing Arts (now AT&T Performing Arts Center), which has become an important cultural facility, bringing people into the Arts District who wouldn't otherwise come into this area of downtown Dallas. ATTPAC will manage a wide variety of programming of country music, dance festivals, jazz, world music and more.

## Careful planning

Sound Space Design, with sound system designer Engineering Harmonics and theatre consultant Anne Minors Performance Consultants, showed that with careful planning a downtown outdoor performance facility could work on this site, so that the City of Dallas and ATTPAC could retain this important public venue. The reopening of the new Strauss Square energises the area, bringing a wide cross-section of public into contact with the theatres, opera house and concert hall in the downtown Dallas Arts District.

The master planning for the ATTPAC site was carried out collaboratively between Winspear Opera House architects Foster + Partners and the OMA team working on the Wyly Theatre. Strauss Square was allocated a plot with the Meyerson and Winspear to the south and east respectively and the busy Woodall-Rogers freeway to the north. While various orientations of the stage



house and audience area were investigated, the final design sees Foster + Partners' outdoor stage nestled under the expansive canopy of the Winspear facing away from the Winspear at a glancing angle to the back of the Meyerson. As acoustician on the Winspear Opera project, Sound Space Design promoted 'joined-up design' with integrated planning of the sound system, stage enclosure and site acoustics.

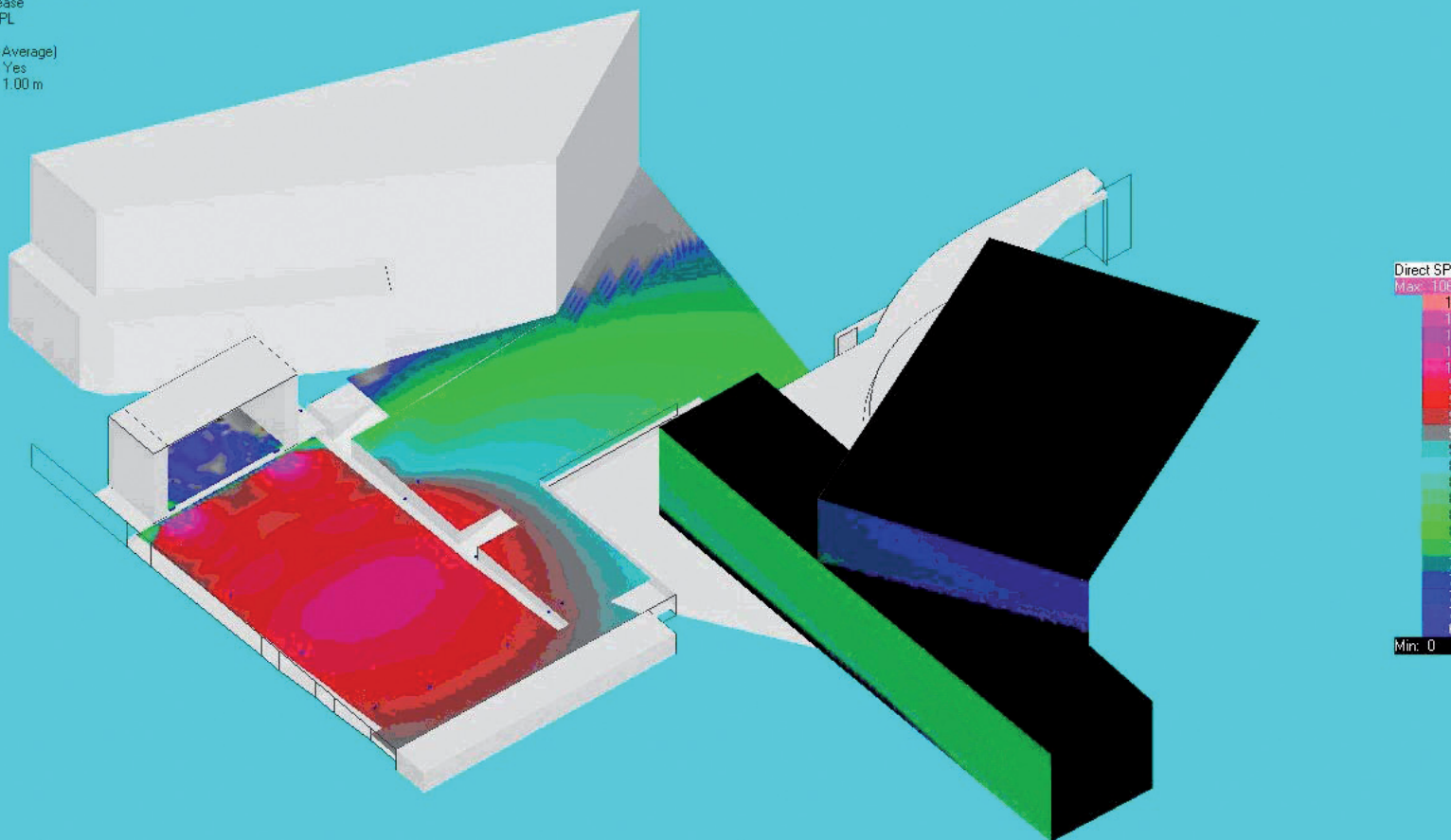
This location and orientation raised a number of acoustical challenges, primarily to ensure that environmental noise did not disturb Strauss Square events and that the Meyerson would not be negatively impacted by music from Strauss Square. Of particular concern were the dressing rooms and offices on the north side of the Meyerson, which have windows overlooking Strauss Square. If these problems could not have been overcome, the project may have stalled at this early stage. Furthermore, having been part of the Meyerson design team during his tenure with Artec, Sound Space Design director Bob Essert had a personal incentive to protect one of his favourite concert halls.

A critical task in overcoming these issues was to optimise the directivity of the PA system so that it covers the audience lawn areas with sufficiently loud sound to overcome road traffic





Ver: 43° Hor: 51°  
Lspk: M1, M1\*, DF1, DF7, DF6, DF5, DF2, DF4, DF3, sub5, sub9, DLY1, DLY7, DLY1\*, DLY2, DLY6, DLY2\*, DLY3, DLY5, DLY4, DLY4\*, DLY3\*, DECK1, DECK1\*, DECK3, DECK3\*, DECK2, DECK2\*, sub10, sub11, sub12, sub13, sub14, sub15, sub16, sub17  
- Speaker Data Not Authorized -  
Project: asq\_ease  
Map: Direct SPL  
Freq: 500 Hz  
(Third Octave Average)  
Shadow Cast: Yes  
Resolution = 1.00 m





## ACOUSTICS

### SOUND SPACE DESIGN



#### The newly developed Artist Square

and aircraft noise, but limits sound intrusion into the Meyerson offices and dressing rooms. High-quality PA design and exemplary pattern control were paramount. Early on, Engineering Harmonics and Sound Space Design used computer modelling of the proposed PA system to determine the effect on the Meyerson and to verify the initial concept design. The model was refined throughout the project to help the team understand the loudest sound level that would be acceptable at the Meyerson façade and gave the client the confidence to continue with the project.

The PA system comprises numerous loudspeaker components positioned and programmed to provide maximum pattern control and sound containment. Left and right line arrays provide the main sound reinforcement and display excellent vertical pattern control – the sound level is very consistent as you move back in the lawn. A horizontal subwoofer array below the front edge of the stage consists of six separate subwoofers and their amplifiers, with careful delay settings to minimise the spread of bass energy. Two ‘stage-fill’ loudspeaker stacks and eight delay loudspeakers around the perimeter of the audience lawn area provide localised sound and reduce the reliance of the system on the main arrays. Anne Minors Performance Consultants devised a suspension system so that, when not in use, the line arrays can track back into weatherproof garages in the stage house.

#### Sound levels

Even with this exceptionally controlled PA system, ultimate sound levels are set by the sound engineer. To give the City of Dallas, Strauss Square and the sound engineer the information they need to control sound levels and monitor the impact on the surrounding venues, Sound

Space Design specified a sound monitoring system that measures and logs the sound levels from minute to minute through an entire event. The measurements are made at the sound mix position in the centre of the lawn and at the boundary wall near the Meyerson office and dressing room windows. Real-time graphical displays guide the sound engineers’ mix levels giving them the freedom to set their own sound levels while being fully aware of and able to tailor their mix to the criteria levels set by the City and operator. During construction, the loudspeaker angles were again refined to minimise intrusion into the Meyerson. Tests were carried out to calibrate the relationship between what the sound engineer hears, what the logging microphone at the Meyerson wall hears, and what the neighbourhood hears.

#### Landscape design

An important factor in the landscape design is a new 3m concrete wall around the boundary separating the audience lawn area from the adjacent freeway. This barrier is significant as it reduces background noise levels on the audience lawn by 10dB(A), meaning that the PA doesn’t have to compete as much with traffic noise and can therefore be set that much quieter. In addition, on Sound Space Design’s recommendation the City introduced secondary glazing in the Meyerson to improve the sound insulation of the dressing rooms and offices, and this plays an important part in the success story.

Overall, the renewed Artist Square has improved the acoustical environment for the Meyerson staff. Artist Square events that used to be disturbing in the Meyerson offices and dressing rooms are now nearly inaudible. Since August, Strauss Square has been used for various events, including country and rock concerts, a world music festival and a live video relay of the Dallas Opera opening night simulcast from the Winspear Opera House. The superb opera acoustics inside the Winspear are matched by the high-quality sound reinforcement system in Strauss Square. Audiences can return to a sparkling new Annette Strauss Artist Square, now run with the programming and technical expertise of ATTPAC. ■

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#### Winspear Opera House, Dallas

"...a venue most other American audiences can only envy."  
- George Loomis, Financial Times

"...superlative sound—warmly resonant, yet offering clarity and projection for consonants and solo instruments, and excellent balance between the orchestra and the singers..." - Anthony Tommasini, New York Times



#### New Garsington Opera, Oxfordshire, UK

Starting with the 2011 season, Garsington Opera's seasonal auditorium will move to a new home. The temporary fabric pavilion will set new standards for unamplified outdoor acoustics. The 600 capacity pavilion has been designed to provide a high degree of acoustical resonance and envelopment, characteristics not normally associated with fabric structures.



#### Strauss Square, Dallas

The most recent addition to the Dallas Arts District, Strauss Square complements the neighbouring Winspear Opera House by providing an outstanding outdoor urban music venue. The new venue brings people into the Arts District who wouldn't otherwise visit this area and since opening in September 2010, has been used for opera simulcasts, a world music festival along with country and rock concerts.



#### Koerner Hall, Toronto

"Singing in the Koerner Hall was one of the nicest experiences of my career... Bravo for achieving that marvelous goal of creating a sensational acoustic." - Frederica von Stade

"From its elegant, intimate design to the spectacular acoustics, this 1,130-seat auditorium is about as good as it gets - for any kind of music."  
- John Terauds, Toronto Star

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# Note perfect

Variable acoustics are key to achieving perfect sound quality at the Carmel Center in Indiana

**Top right: Lifting rigging equipment into the attic**

**Bottom right: Carefully installing the hoist machinery into the tight confines of the attic**

**Below: Project manager Bridget Cox with one of the high capacity hoists in the JR Clancy manufacturing facility**

Visually stunning in its neoclassical design, the Palladium at the Carmel Center for the Performing Arts is already impressing Indiana residents, even before a single note has been played inside the 1,600-seat concert hall.

The true measure of the hall's quality, however, will come once the building reaches completion in November 2010. As Carmel's resident orchestra and other ensembles begin their first rehearsals in the Palladium, they will experience extraordinary sound quality – made possible by acoustical specialist Artec Consultants and the rigging experts at JR Clancy.

The secret is variable acoustics: the science of adjusting the sound quality to accommodate any performance, whether it's a solo vocalist, a classical guitarist, or a full symphony orchestra. It takes highly specialised expertise to bring the right factors together to accomplish this goal.

Artec's plan called for multiple motorised acoustic canopies and acoustic curtains that can be adjusted to change the room's response. Three large motorised speaker clusters provide amplified sound when performers require it. All of these elements offer the flexibility the house sound engineer or conductor requires to 'tune' the hall for each performance.

"When you listen to a sound coming from the stage, you hear the sound directly, but you're also hearing the first reflection – the sound hitting the ceiling or the wall and coming back to you," says Christopher Darland, Artec senior engineer. "We work to create a sound environment that allows the first reflection and other reflections, which help to create a sound field. This colours and enriches the sound coming from the instruments."

Poorly designed concert halls create major issues for the musicians as well as the audience, Darland says. "What often happens in a concert hall is that the left side of the orchestra can't hear

the right side. The musicians really need to get the first reflection back to stay in time with one another. One of the ways to affect this is with an additional canopy over their heads, which provides a very important horizontal reflector. The canopy works for the audience as well, especially those in the middle of the main floor, who are usually getting a delayed first reflection from the ceiling of the auditorium."

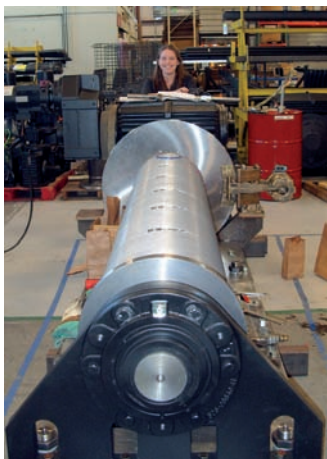
Such canopies are usually made of wood, but the Palladium required an unusual material for such an application: large panels of clear glass. Selected by architect David M. Schwarz, the glass keeps the canopy from masking the Palladium's intricately decorated domed ceiling. The glass panels vary in size and thickness, measuring an inch at their thickest points.

## Glass canopies

To accommodate the glass canopies, the JR Clancy team designed and built massive hoists with capacities of 10,400kg. Each of the four hoists has a motor brake, supplemented with a 76cm-diameter disk with dual airbrakes.

"The hoists are travelling drum hoists, with lift lines that come directly off the drums to enter a complex web of blocks," says Bridget Cox, Clancy project manager. "The blocks divert the lift lines to the correct ceiling tubes through the dome. To ensure the safety of the audience sitting beneath the glass canopies, we used a ten-to-one design factor – so the lift lines can support 10 times the weight required by the system. For additional safety, we added air calliper brakes on each hoist, and electronic load cells for each of the 81 lifting cells."

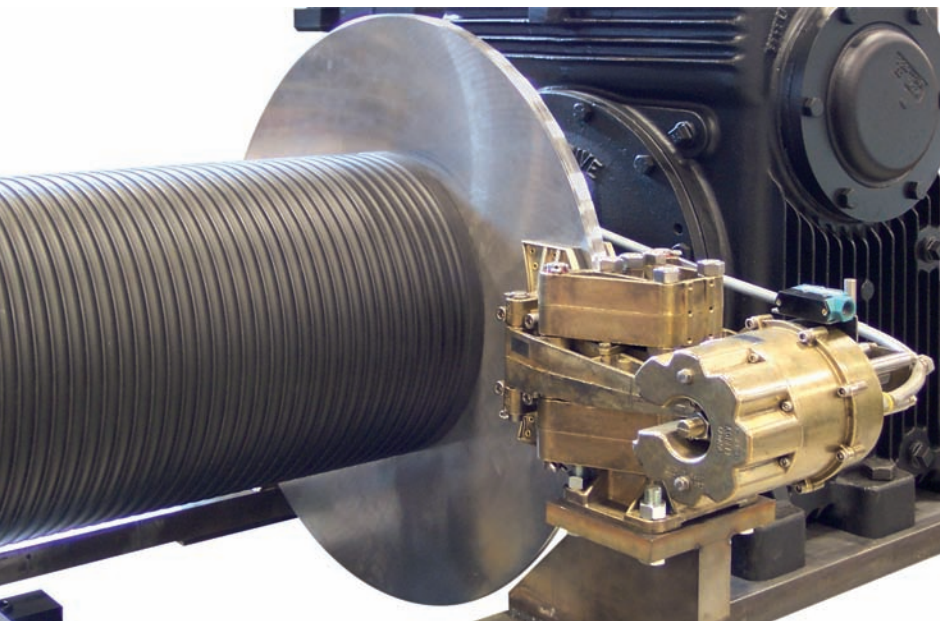
Sound technicians can raise and lower the canopies on the hoists using Clancy's SceneControl 500 automated control system, which provides excellent motion control and 3D visualization of the performance space. SceneControl's industrial-grade controller,











**One of the canopy hoists, showing the 76cm disc brake with dual air brakes**

developed by JR Clancy, is based on the same processor used for elevators and computer-controlled manufacturing – making it one of the most reliable systems in the industry.

Clancy engineers recognised early in the process that the hoists would be installed in a narrow, closed space above the hall's domed ceiling. They designed the hoists so they could be disassembled, loaded into the attic in pieces, moved up two levels, and reassembled. Clancy's design team worked closely with the Artec Consultants to develop an ingenious lifting system that allowed the hoists to fit into the space without compromising the architecture.

In addition, Clancy provided eight hoists in the ceiling to lift the concert lighting trusses. Three more hoists raise and lower the speaker clusters, which are stored in the basement in ready-to-use position. Hoists with capacities from 680kg to 1,600kg support the speaker clusters, each with motor and load brakes for additional safety.

"The attic rigging was the main scope," says Tony Eisenhut, senior manager with Shiel Sexton, the City of Carmel's construction management company. "Through the dome, there are 157 cable pass-throughs. It was a tough design – and there were five contractors to make that part come together."

The rigging went into the hall without a hitch, Eisenhut says, in large part because of JR Clancy's ability to coordinate with all of the other contractors involved. "JR Clancy's work has been top-notch," he says. "They are on the top of the list as far as coordination, they're very schedule driven, and they make sure stuff is here when it's supposed to be here. Clancy has good management and great field people."

Artec's design makes it possible for the Palladium's acoustics to be controlled even further, using a mix of motorised and manually adjusted curtains throughout the hall to provide additional sound diffusion and reflection.

Beyond the acoustics, Clancy's work extended to the floor level as well. The company provided and installed a 19 x 3m Gala Spiralift forestage lift with 6.5m of travel, which moves a forestage section into place to extend the platform when a full orchestra performs. In addition, Gala and Clancy designed and built a house mix lift with 5.3m of travel, for use in moving the sound-mixing console into place in the audience chamber for front-of-house mixing.

### **Successful construction**

The successful construction of the project has been no surprise to Artec, as the company and JR Clancy have collaborated frequently on large acoustic structures around the world. Their projects include the Renee & Henry Segerstrom Hall in Orange County, California, SangNam Hall in Seoul, Korea, Jazz @ Lincoln Center in New York City, and many others. "We really like working with Clancy," Darland says. "They always ask the right questions, and ultimately, we always come to the best solution for everyone."

An ISO 9001-certified company, JR Clancy accomplishes this level of customer satisfaction by bringing its quality management system to bear on every job, especially complex projects like the Palladium, says Mike Murphy, president of JR Clancy. "Our company mission is 'make our partners successful' and to achieve this we employ a planned quality assurance programme that guarantees that every project meets or exceeds our customers' expectations." ■

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## LIGHTING

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# Lightshow

A new ceiling with the latest lighting has been installed in the recently refurbished De Doelen Theatre in Rotterdam

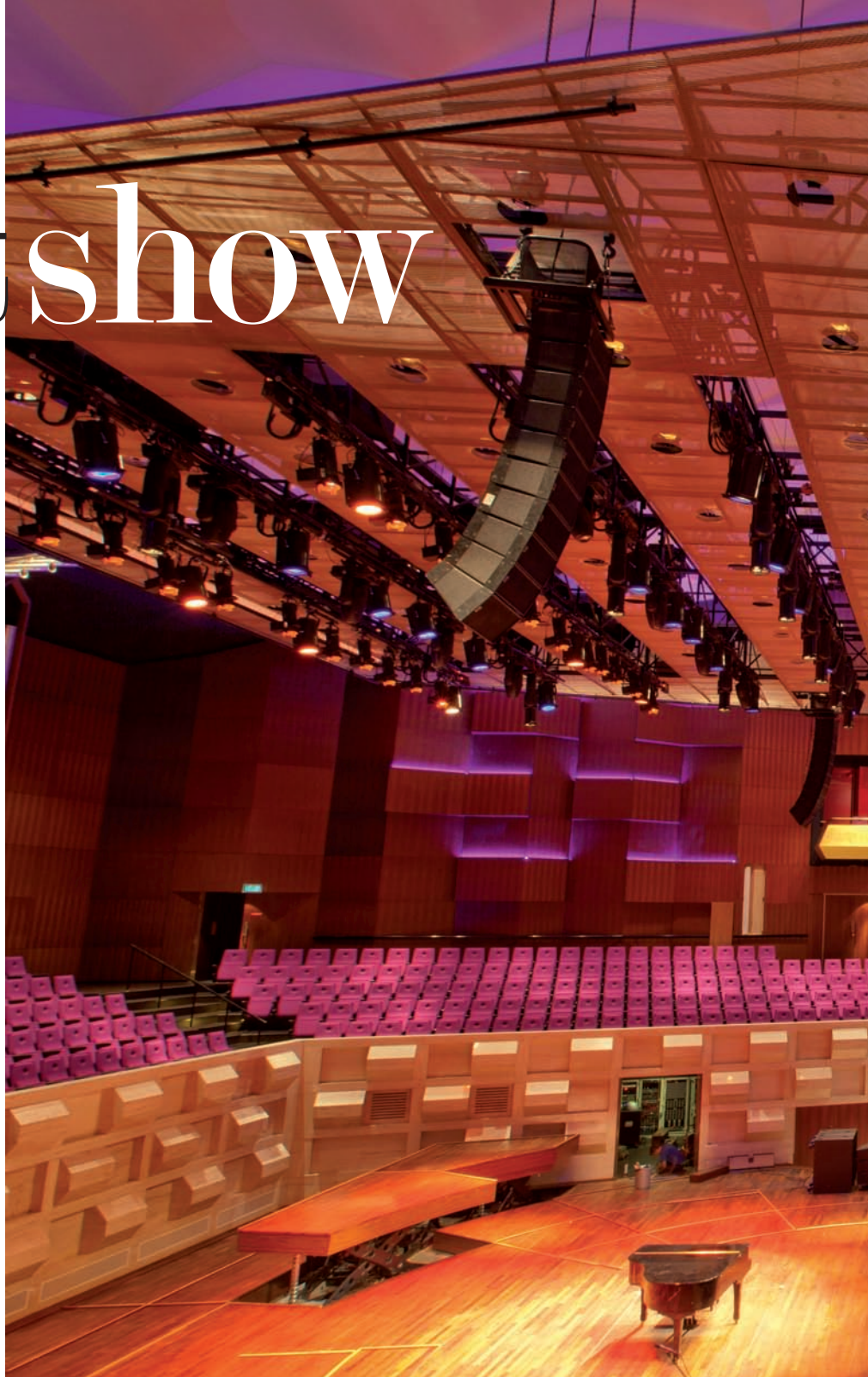
**D**e Doelen Theatre and Congress Hall in Rotterdam, Netherlands, has benefited from a multimillion Euro refurbishment. This was completed in spring 2010 with the installation of a new ADB-TTV Technologies-based lighting system supplied by the Belgian manufacturer's Dutch distributor, Controllux, accompanied by additional audio systems.

Opened in 1966, the theatre was – and is to this day – home to the Rotterdam Philharmonic Orchestra, with classical music accounting for some 90% of the hall's usage, the remainder from light pop, jazz and other performing arts. A new congress hall was added to the complex in 1997.

In 2009, the 2,200-seat auditorium required a major rebuild to rid its ceiling of asbestos, and De Doelen's management seized the opportunity to upgrade technical production facilities that were beginning to show their age, give the interior a complete makeover with modern materials, and move its rear wall back by 3m to provide space for new control booths.

De Doelen technical manager Frank van Donkersgoed says: "When we knew that we had to take out the ceiling, we immediately looked into the possibilities of changing the hall's technical facilities. It was built in 1966 so there wasn't really a lot of high-tech equipment. But we wanted to get the facilities up to standard, while at the same time not negatively influencing the architecture. As part of that desire, we decided that all the new technology should be hidden, wherever possible, when not in use."

The new look includes a radical reworking of the stage ceiling and the production systems. It now features a suspended technical ceiling that incorporates a curved acoustic canopy, coated with woven bronze that controls early reflections from the orchestra. It's partly hidden by a fine



**The impressive 2,200-seat auditorium at the De Doelen Theatre and Congress Hall in Rotterdam**

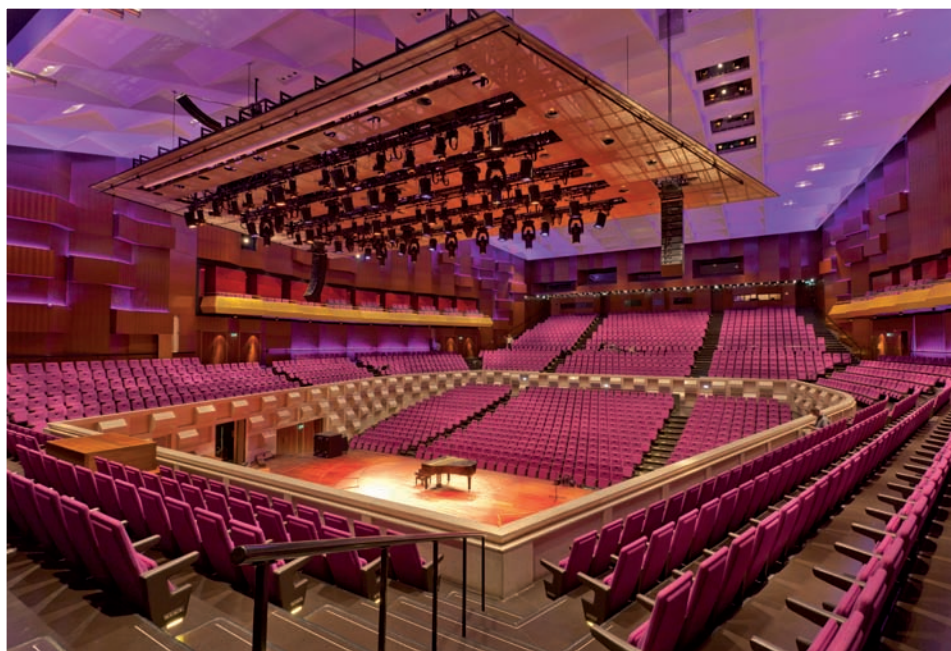
translucent scrim, with openings through which the main overhead lighting rig protrudes. The combination appears almost to float in mid-air, leading to its construction-period nickname of 'the UFO'. A pair of loudspeaker line arrays, which drop through the canopy for amplified events, retract fully out of sight into the ceiling when not in use, while others are concealed behind grilles in the walls.





The visual attention to detail continues in the main roof, where traditional lighting bridges have been replaced by shuttered panels set into the acoustic diffusion pattern of the ceiling. “Not spending money on lighting bridges,” says van Donkersgoed, “saved a lot of money and we were able to create a more intelligent solution.”

Behind those shutters, which are remotely controllable from the lighting desk, is a total of





## LIGHTING

ADB LIGHTING TECHNOLOGIES



**Much of the lighting is hidden behind automated wall panels in spaces created within the theatre's walls**

some 70 ADB luminaires, including a dozen of the company's WARP/M zoom spot profiles.

"The WARP/M was the first moving fixture we discovered that was pretty much silent," says van Donkersgoed, "and for use in a concert hall that's one of the most important features – that it can dissipate its heat without making a noise. We bought four of them three years ago to do some experimenting and decided to purchase a lot more. We often have to make very small adjustments in a very short period of time, so you cannot lower a bridge, step into it and make adjustments because there are already people in the hall. If the conductor realises that one of the solo singers should be on the other side, half an hour before the concert, you have to adjust the lighting. For that reason we wanted intelligent moving lights that would be quiet enough."

### Dimming solution

The lighting in question comprises a mixture of 30 Motorised WARP/M 800w Zoom and six Motorised WARP/M 575w Daylight Zoom units, with 62 ADB Niethammer HPZ211X 2kW Zoom Profiles and 54 C203 2kW PCs. Many are revealed by the ceiling shutters, while others are hidden behind automated wall panels in spaces created within the theatre's thick concrete walls. Behind the scenes, the rack rooms house a trio of the company's newest dimming solution, the EURODIM Twin Tech dimmer, which combines traditional thyristor with ultra-modern sine wave dimming, the latter's major benefit being that it induces no acoustic noise in a lamp's filament, lowering stage noise still further. The auditorium is serviced by 488 channels of dimming.

"We generally don't use the moving heads in motion during classical shows," says van

Donkersgoed, "but more to make adjustments in advance. But maybe people will get used to it."

Kuno van Velzen of Controllux, by a quirk of fate, found himself providing lighting in a theatre where his father, Hans, had been involved in the original 1960s technical design. "Today it's a very different proposition," he says. "The lighting infrastructure is extensive and we aimed to make full use of the flexibility of the EURODIM Twin Tech dimmers – one is positioned behind the left and right hand walls, and another, with sinewave dimming modules, in the ceiling above the stage.

"We have five lighting bars, each individually divided in two and they can be lowered down with the technical ceiling for maintenance. They contain all the theatrical and orchestral lighting, a mixture of automated WARP/M units and conventional fixtures." Walkways above the ceiling allow access to the WARP/M units, PCs and other fixtures behind the shuttered hatches.

"The end result," says van Velzen, "is that orchestra changes can be accommodated and re-lit very quickly and without the need for technicians to crawl about in the ceiling refocusing lights. And for re-locating or servicing units, it's simple to bring the rig down and work on it. You also have much more flexibility with focusing thanks to the automated zoom profiles."

Frank van Donkersgoed professes himself satisfied with the outcome. "We're very happy with the end result. Not only happy; we're actually pretty proud of what we did in a hall that has its own character, its own standing that it's had for 40 years. Its still essentially the same hall but much improved and the reactions from our visitors has been very positive." ■

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# LIGHTING INTELLIGENCE



ADB Lighting Technologies' systems bring subtle lighting intelligence to the refurbished De Doelen Concertgebouw in Rotterdam, the Netherlands.

For the ultimate in precision re-positioning and shuttering, combined with silent, fanless operation, De Doelen chose ADB WARP/M 800W Motorised Zoom Profiles and WARP/M 575W Motorised Daylight Profiles.

They're complemented by the power of ADB Niethammer compact 2kW Zoom Profiles, and ADB C203 Prism Convex 2kW PC fixtures.

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**SEATING**

DAUPHIN NORTH AMERICA

# Seat of power

Dauphin has capitalised on a gap in the market for luxurious, high-tech installed seating in design-driven environments





**D**auphin North America entered the installed seating market when it represented Ares Line in the United States and Mexico. The combination of Dauphin's design expertise and Italian firm Ares Line's Innovative Seating Systems created a dynamic team, dedicated to exceptional design and outstanding customer service.

With a production facility located in Toronto, Canada, this partnership offers many advantages to its clients, including knowledge of the North American market,

technical support, quick response times and competitive pricing. "We noticed a gap in the market for more design-driven environments," says Dauphin's chief operating officer Stuart Rogers-Brown. "Entering the installed seating market with Ares Line allows us to offer products that have been tested and approved in markets around the world, including the USA. Their knowledge and experience has helped us gain exposure in this market."

Dauphin offers a selection of installed seating designs with various applications and



## SEATING

DAUPHIN NORTH AMERICA



### MALL OF AMERICA FIELD, MINNEAPOLIS, MINNESOTA, USA

**Client:** Caterpillar Paving Products

**Architect:** NELSON

**General contractor:** Mission Construction

**Products:** Installed Seating – ‘Eidos’ by Dauphin



Terry Sharp, marketing director for Caterpillar Paving Products, contacted Rick Sutton, managing principal at architect NELSON to set up a meeting. Caterpillar had signed a two-year lease for a suite at Mall of America Field, home to NFL team Minnesota Vikings, and needed assistance in redesigning the space to provide a world-class space where Caterpillar and its clients could support the Vikings. But there was a catch – the design, construction and installation of the furnishings would all have to be completed for the opening match between the Vikings and the Seattle Seahawks just eight weeks later.

NELSON has provided design services for Caterpillar Paving Products’ Brooklyn Park facility for several years, including renovations of the building entry lobby, conference areas, restrooms and office areas. The company knew that Caterpillar would want a heavily branded environment, using durable materials and finishes. The suite had not been updated since the opening of the Metrodome in 1984 and NELSON’s recommendation to gut the entire space was readily accepted by Caterpillar.

Design concepts were quickly generated using Google SketchUp software, so that the client could immediately get a sense of what the renovated space would look like. New ceilings, with dimmable lighting and extra air conditioning systems, were all installed to enhance the comfort and ambiance of the suite. Three large flatscreen TVs would show all the action and replays and the yellow and black colour scheme was used to reinforce the Caterpillar brand and provide a lively feel throughout the space, while materials were selected based on their durability and colour.

Dauphin’s Eidos installed seating was chosen for its sleek appearance and exceptional comfort, and replaced the standard-issue stadium seats. During the 25-day fast-track construction process, Dauphin did everything it could to ensure the deadline was met: the seats were quickly delivered and the company offered assistance with installation on site.

As the Vikings prepared for the 2010 season, the stadium was a hive of workers, cleaning, painting and updating the venue – but perhaps the most astonishing transformation was in Suite 132D, Caterpillar’s suite located on the 45-yard line. On 27 August, as the last trim was being installed and the surfaces polished, Minnesota Vikings employees declared it “better than the owner’s suite”. The two pre-season games hosted so far in Caterpillar’s new suite have been a huge success, and Caterpillar is looking forward to enjoying future Vikings’ games in style with its clients.

features. The range includes Eidos, an installed seating solution that provides elegance, style and maximum comfort for auditoria and theatres. In addition to its sleek design, Eidos can accommodate all technical requirements, enhances acoustics, and can also incorporate multimedia and air conditioning. The seat offers a number of design options, including a wooden back, various arm cap finishes, embroidered seat and row numbers, and a choice of upholstery. Eidos is the result of much research, to come up with innovative solutions to design seats that provide maximum comfort to people over long periods of time.

Dauphin uses both its dealer network and its national sales representatives to service its clients and it offers consultative services to its clients at professional venues where professional solutions are required. Seating can be fitted to accommodate a room’s acoustics, multimedia requirements, safety exits, air conditioning and flooring, and as well as the standard fixed seating, Dauphin offers ‘solutions on demand’ where bespoke seating solutions are created for any scenario.

#### Installation process

Right from the start of the installation process, careful consideration is given to environmental constraints, safety regulations, durability and acoustic performance. Dauphin’s designers and R&D people work together to create the best possible design to meet the client’s specific requirements. Clients are presented with a 3D image of the proposed installation, and after the prototype has been approved, the product is engineered and manufactured in compliance with all current regulations and certifications.

“Dauphin has also added a unique cloud computing software system called Vondle, which houses the entire project history in one place, giving managers access to projects and ensuring that all parties involved are aware of the project details and status at all times. This process ensures that advanced products are always manufactured to meet clients’ needs with the highest of standards,” says chief operating officer Stuart Rogers-Brown. ■

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# Sitting pretty

The ARC range of seating offers a whole range of options to satisfy the demands of any venue

The ARC MAX (opposite); the ARC ONE padded seat (below)

In 2006, UK-based Ferco Seating got together with Eheim Moebel, a seating specialist from Germany, and set about designing a range of seats to meet the future demands of auditoria and stadia around the world. It had become apparent that owners and operators of public facilities needed a wider choice of seats, even within a single facility, so the two firms set about designing a range of seating with a common mounting arrangement that could accommodate anything from general to VIP seating.

Ferco employed the services of Carsten Eichler, a renowned German designer, to help it create a vision for the auditorium seat of the future. Eichler has extensive experience in the design of public seating systems and his first decision was to make a beam-mounted seat that would allow the seats to be spaced in virtually any position. This gives operators complete flexibility to align the seats perfectly, and the freedom to upgrade the seats without having to change the beam structure, or to add options such as armrests, cupholders and writing tablets later.

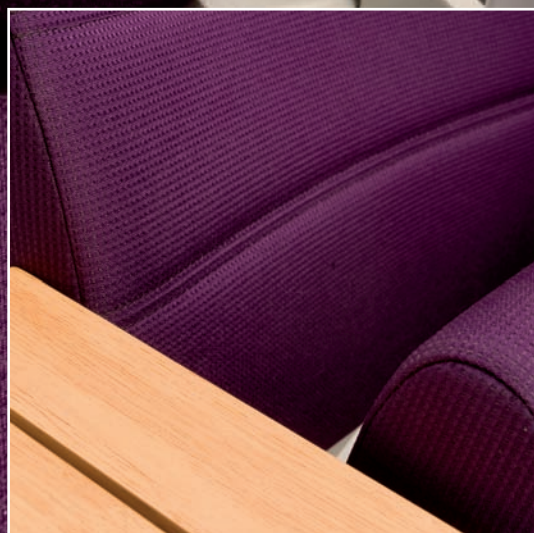
The next task was to design a comfortable, durable range of seats, which had the same aesthetic outlook and beam attachment, as well as a contemporary look and an appropriate size. In terms of comfort, Eichler used the latest data available to achieve perfect ergonomics. As for size, the team wanted to make the seat available in a number of different heights, while ensuring that when the seat was folded up, it was small enough that it didn't block peoples' access.

Once the ergonomics and size were agreed, they set about deciding on the manufacturing process, materials and finishes. First came the ARC SHELL, a simple one-piece bucket seat that was available either in plastic injection or blow-moulded formats. This model became the basic seat for budget-conscious customers, but can be upgraded easily with armrests, cupholders and writing tablets as optional extras.

Next came an economical plastic tip-up seat – the ARC LITE. This is a two-piece blow-moulded seat with the option of two different back









## SEATING

### FERCO SEATING



heights for greater comfort. The same options are available as with the rest of the ARC range. There is also a more compact version – ARC COMPACT – which is suitable for mounting on retractable platforms.

Next up were the padded versions, starting with ARC ONE, which has upholstered padded inserts in the seat and plastic outer backs and seat pans. This model also comes with the option of two different back heights and an acoustic perforated seat pan. Next up the ladder is the ARC MAX, which is similar to ARC ONE except it comes with a fully upholstered high back. For more demanding applications, the ARC VIP has a fully upholstered seat and back with the option of individual or shared armrests. The upholstered seats can be supplied in vinyl, leather or fabric.

The final step was for Eichler to design a seat made of wood – ARC WOOD. In many markets today, wood is the material of choice, both for aesthetic and environmental reasons. There are two types of wooden ARC seats: a basic single-wall ply, tip-up seat – ARC WOOD; and a double-wall ply, tip-up seat – ARC WOOD Premium. Both these models come with padded upholstered options and three different back heights. This model is produced in Europe, where Eheim Moebel has the Chain-of-Custody Certificate from the Forestry Stewardship Council. Ferco Seating is ISO 9001 certified and also certified for ISO 14001 for Environmental Management Systems.



**The ARC WOOD Premium**  
(above); the ARC ONE (above  
left); the ARC LITE (below)



Since the ARC seat can be used in such a wide variety of installations, Ferco decided to adapt its Wrimatic tablet arm so that it could be used with any of these ARC seats. This tablet arm has been popular for more than 10 years due to its unique design, size of writing surface and strength. Since the ARC seat was launched in 2008, it has been installed in a wide variety of facilities including: Dubai Modern High School auditorium; Dodoma University, Tanzania; Rhine Neckar Arena, Germany; and KSAU, Saudi Arabia. ■

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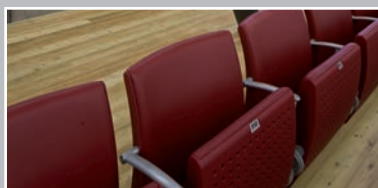
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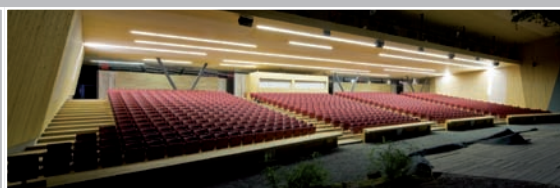
### ARC LITE

MODERN SCHOOL  
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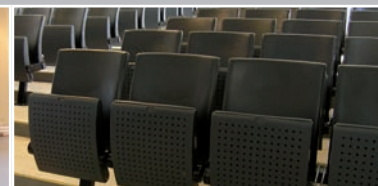
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### ARC ONE

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# Best seats in the house

At Lincoln Center's refurbished David H Koch Theater, audiences are enjoying new, more comfortable seating

When the New York City Ballet and the New York City Opera undertook the \$100 million renovation of their Lincoln Center for the Performing Arts theatre, they turned to Ducharme Seating to replace the more than 2,600 seats in the auditorium they share. The rave *New York Times* review following the gala reopening of the theatre in 2009 proved the wisdom of their selection. "With its new seats, offering firm cushions and ample back support, the Koch Theater may be the most comfortable house in New York," lauded the paper's chief music critic.

The renovation of the David H Koch Theater had been a long time coming. Since the Philip Johnson-designed building opened in 1968, there had been small changes to the hall but most of the building, then known as the New York State Theater, had not been touched. In 2007, the Opera and Ballet agreed that the replacement of the seating, which was original to the building, would be part of a complex renovation programme to begin in mid-2008.

Theatre consultant Schuler Shook and JCJ Architects, part of the renovation team assembled and led by Landair Project Management, developed specifications for the seats and asked a shortlist of five firms to respond with prototypes. "This was our opportunity to enhance patron comfort and theatre acoustics, while meeting Americans with Disability Act requirements," says Mark Heiser, the managing director at City Center for Music & Drama,

the organisation that oversees the building. "Ducharme responded to our specs with the seat we were looking for and it passed a rigorous evaluation process by the consultant team, Opera and Ballet representatives and various board members. They stood out in their responsiveness, and that stayed true throughout the project."

## Comfort assured

To assure comfort, Ducharme explored several combinations of foam and padding to arrive at a combination that also met stringent acoustic requirements. And the design had to anticipate the eventual introduction of seatback electronic titling, which is planned for a later phase.

"Ducharme answered each request for a change or refinement quickly and that is what kept impressing us about the firm," says Heiser. "With a project this complex, we had to know we could count on them."

"Seat replacement was a very visible part of the project," says Landair's project executive John MacKay, "so we were very careful about whom we selected to do it, especially since the country was in challenging economic conditions. Ducharme passed all of our evaluations – and that included visits to its corporate home and manufacturing plant – with flying colours." Indeed this would turn into another success for the firm that has devised seating for the Sony Center for the Performing Arts in Toronto, ON; the Wachovia and Knight theatres in Charlotte, NC; and the upcoming Stanford University Bing Concert Hall in Oakland, CA.







SEATING



## SEATING

### DUCHARME SEATING



The seat Ducharme offered was a variation on its Tristan Seat, a fixed seat that offers a high degree of comfort, luxury feel, and a strong, clean aesthetic in keeping with the theatre's celebrated interior. In this case the upholstery is Yukon red mohair, close to the vibrant colour of the original seating, with birch backing and seat pans finished in black lacquer. Midway through the project, the team began working with a new acoustician, Jaffe Holden Acoustics (JHA), who reviewed all of the previous acoustic recommendations. After conducting a thorough review of the seat design, JHA called for a new seat bottom and Ducharme created an effective solution.

#### Installation schedule

While responsiveness was one big plus, another was the firm's ability to work with a super-fast-track production and installation schedule – and that meant eleventh hour changes in the seating plan. Ducharme won the contract in September 2008 with the opening of the theatre targeted for early November 2009. But since the theatre closed down only during the summer months and the two Opera seasons (the Ballet maintained its regular schedule), timing was tight – and there was a lot going on. Ducharme had to coordinate seating installation with the installation of new HVAC and stage lighting systems along with the introduction of an enlarged orchestra pit, a pit elevator and an entire new media suite. Close teamwork with the architects and general contractor made it all possible.

The theatre decided on a much-publicised change in the orchestra seating arrangement just months before opening. Johnson's original design



**The new seats at New York's David H Koch Theater offer audiences feature Yukon red mohair upholstery with birch backing and black lacquer**

had called for continental seating at orchestra level, which meant that all patrons had to enter from the far right or left side and work their way to their seat. While the 40-inch legroom was generous, the trip to a centre seat could still be arduous. In a marked turnabout, the Ballet and Opera decided to introduce two aisles, which meant reworking the seating arrangement.

"The change was dramatic," says Heiser. "Along with introducing sloped aisles in the auditorium, we also had to quickly modify the aisle seats' panels, lighting and pedestals to accommodate new transitional wedges in the floor. Ducharme incorporated the changes and also designed a lightweight, removable seat to accommodate wheel chairs and meet ADA requirements. We ended up with 16 versions of the seat for different uses in the house."

Ducharme Seating is based in Montreal, and because its manufacturing facilities are located within a 500-mile radius of New York City, this garnered LEED points, as did the use of mohair for the seat covering. Installation training, which began in March 2009, incorporated some of the theatre's stage hands. The company's participation in the installation process gave it hands-on experience with all versions of the seat, useful when the theatre went into full operation.

The renovation's changes make a noticeable impression. The sound is more immediate, the size of the orchestra can be larger, the lighting subtler and the seating much more welcoming and comfortable. For the last part of the experience, audiences have Ducharme Seating to thank every time the curtain rises. ■

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# Back in business

After years of neglect and decay, the curtain rises again at the Teatro Campos Eliseos in Bilbao

**M**ore than a century after opening in 1902 and after 20 years of decline, the Teatro Campos Eliseos in Bilbao, Spain reopened on 11 March 2010. An outstanding example of Art Nouveau architecture, the venue, now restored to its former glory, is one of Spain's most technologically advanced multipurpose venues for the performing arts, musical presentations, artistic and educational events. Along with many other technological advances, this venue now showcases one of Gala Systems' fully automated seat and floor transformation systems.

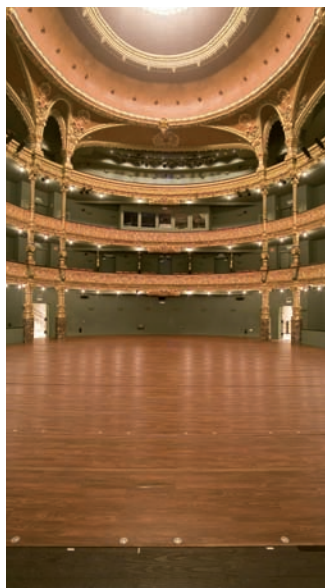
The Teatro Campos Eliseos was originally built by local Bilbao architect Alfredo Acebal in collaboration with French-Basque designer Jean Baptiste Darroquy, who created the distinctively ornate Art Nouveau façade, characterised by organically inspired curvilinear forms. The theatre is recognised by the local Basque government as "a heritage building of high cultural significance".

## Complete restoration

The renovation project was conducted over a five-year period, during which the building underwent a complete restoration of the façade and a floor-to-ceiling renovation of the entrance hall, inner hall and proscenium, while preserving the venue's unique Art Nouveau architectural heritage. Seating areas were updated with the integration of a fully automatic Gala Venue space reconfiguration system that can easily and speedily transform from one configuration to another to meet the requirements of individual events. All of the interior improvements – including design and installation – were managed by the engineering department of the General Society of



**The front of the Teatro Campos Eliseos in Bilbao and (below) the main hall**



Authors and Publishers (SGAE). Improvements include: a motorised over-stage system provided by Trekwerk; audiovisual live recording studios equipped with internet connections that can be used for live transmission during events; digital consoles for processing and mixing; ultra-compact powered speakers by Meyer Sound that provide distributed effects at the perimeter and other areas; an HD camera system to record any activity that occurs both in the main hall and in the sixth-floor multipurpose room; and a full-resolution digital projector 4K (4096 x 2160 pixels).

Funding for the project was borne jointly in equal parts by the SGAE and the City of Bilbao under an agreement signed between the two institutions in December 2003, which stipulated that management of the venue was to be transferred to the SGAE for a period of 30 years. From the start, the SGAE decided to turn the Teatro Campos Eliseos into a thoroughly modern multipurpose cultural space offering a wide array of events – without sacrificing the aesthetic integrity of the venue.

Eduardo Bautista, president of the SGAE, said: "The Teatro Campos Eliseos is to be a cutting-edge, multi-purpose cultural space offering a varied programme of theatre, new media, music and contemporary dance, with special attention to authors and the Basque Euskera. It will also serve as a training centre for various artistic disciplines and serve as the permanent headquarters of the SGAE in Bilbao."

The work was undertaken by SGAE's Eduardo Bautista and a project team composed of architect Santiago Fajardo, the technical office of the SGAE led by Angel Quintanilla & Julio Cejalvo, and assisted by a team from Garcia Dieguez Consulting. The project team worked









**The theatre's main seating area and (inset) the Gala Venue space reconfiguration system**

closely with Gala Systems from the very early stages of the project to design a custom, fully automatic Gala Venue space reconfiguration system that allowed the configuration of the rows nearest the stage with minimal impact on the architecture and building infrastructure. The completed Gala Venue rotational seat storage assembly was integrated into the existing 1.3m-deep foundation.

Besides the spectacular main hall, the building also houses the offices of the northern territorial delegation of the SGAE, a restaurant and multipurpose rooms for new media presentations. With a programme composed of "varied arts and genres for all ages" according to Luis Álvarez, musical performances will comprise a share of 42% of venue usage, followed by drama at 29%. Training and dance performances will comprise the remainder.

The new Teatro Campos Eliseos is a harmonious balance of art and technology that is flexible enough to host a multitude of different events over the course of a single day in a wide range of seating configurations that maximise accessibility and comfort.

Following the success of this project, the SGAE has embarked on collaboration with Gala Systems on several new upcoming ventures including the Teatro Paralel project in Barcelona and the CITE project in Seville, Spain, which also includes fully automated seat and floor transformation systems. ■

## Teatro Campos Eliseos

**Total surface area:** 7,891m

**Stage dimensions:** 12m x 10m

**Capacity:** Main hall – 805; main hall with orchestra occupied – 1,120; classroom – 100

**Configurations:** Grand theatre, conference hall, banquet hall, rock configuration (flat floor)

**Sound:** 35,000W (Meyer Sound Melodie); Digico SD8 mixing consoles  
**Video:** HD video projection system (6 cameras) with full-resolution digital projector 4K (4096 x 2160 pixels)

**Overstage:** 35 motorised pipes by Trekwerk, capacity of 900kg and a maximum speed of 1.8m/s + 6 point hoist (1,000kg)

**Lighting:** 312 x 3kW + 60 x 5kW ETC Sensor dimmers + Ethernet/DMX network; 250 lighting fixtures and 18 Clay Paky moving lights

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# Living the dream

The Sentosa theatre in Singapore had to be decked out with a dazzling array of engineering and special effects to do justice to a production of *Voyage de la Vie*

**S**ingapore's new integrated resort, Resorts World Sentosa, has notched up plenty of records – the world's largest Marine Life Park, Southeast Asia's first and only Universal Studios park, the nation's first casino, and now Singapore's first-ever home-grown resident circus spectacular.

Installation designer Theatre Projects Consultants, and show producer The Generating Company, turned to worldwide stage engineering specialist Stage Technologies for bespoke engineering, rigging and automation of the purpose-built Festive Grand Theatre. Stage Technologies also provided control systems for the Hollywood Theatre in the complex's Universal Park. With a long history of working on purpose-built resident theatres with Cirque du Soleil and Dragone, Stage Technologies had both the foresight and experience essential to help the Singaporean venue create its own distinctive style of pageantry from the ground up.

Designed by DPA Architects, the 1,600-seat Festive Grand Theatre is a plenary hall style venue, approximately 4,000m<sup>2</sup>, situated in a chamber beneath the orchid-themed Festive Hotel, and home to *Voyage de la Vie*. The show was conceived by Mark Fisher as creative producer and Phil McKinley as show director, and sets were designed by Ray Winkler. Stage Technologies has worked on bringing numerous Mark Fisher designs to life, including the award-winning Tree of Prosperity at the Wynn Hotel in Macau and Las Vegas resident casino shows *KÀ* and *Viva Elvis* by Cirque du Soleil.

*Voyage de la Vie* played its world première on 2 July and follows a boy's journey to find his purpose. His adventure takes him into realms

where he encounters metaphorical characters representing themes such as Love and Death, played by contortionists, jugglers, rope aerialists, crossbow artists, balance performers and illusionists.

Engaging over 40 cast members from 16 countries, *Voyage de la Vie* is not short of quick-fire action and electrifying stunts and needs a theatre automation system that can keep pace. The whole-house system includes performer flying winches and point hoists, multi-line winches carrying up to 1,400kg each, lighting bars, curtain tracks, scenery tracks, lifts, three stage trucks, three revolving carousels, two Nomad portable control desks and two Solo G3 handheld consoles. The grid of the venue is exceptionally low as the theatre space is situated below a swimming pool, meaning that there is no fly tower for scenery storage, so tracks feature heavily in the stage design.

## Automated tracking

The opening 'office block' sequence uses automated tracking to bring in two 'buildings' from stage left and right, which, along with a flown set piece, perform a sequence of choreographed movements while acrobats perform on the moving platforms, culminating in spectacular pyrotechnic displays. Several cross-stage overhead tracks carry a variety of rapid-change scenic elements. A substage lift along with a drop-and-slide trap are frequently used for dramatic exits and entrances, as well as for lifting heavy props onstage, including a piano and a motorbike.

Fisher's dream-like sets are constantly dissolving and reforming and, to help create this



The main stage at Resorts World Sentosa in Singapore





Voyage de la Vie finale on the Festive Grand Theatre stage © 2010 Resorts World at Sentosa Pte Ltd





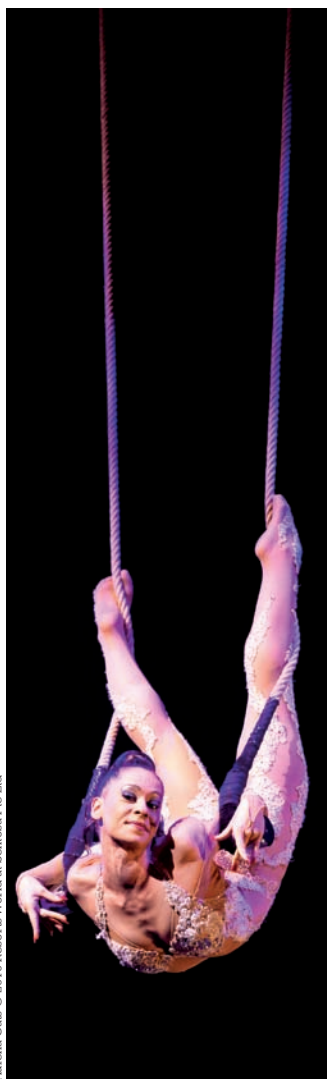
impression of fluidity, the power flying system is used to bring in a miscellany of set pieces: an avenue of Chinese poles, the Crystal Cat's crescent moon throne, a dragon's head that drops pearls for the jugglers, and the crossbow 'hoop of fire' that fires flaming arrows in a death-defying William-Tell scene.

Of course, for a circus-themed show, flexible performer flying was high on the system specification list, as trapeze, hoop, rope, silk and strap aerialists are omnipresent throughout the boy's rite of passage. His ascension into the other world offers a **unique performer flying** moment, in which the boy, suspended from the end of a pivoting golden ladder, is flown out to the theatre grid. This is a complex timing issue for the operators, as the arc of the bottom of the ladder produces a considerable increase in speed as the set piece travels – a speed change that needs to be matched exactly by the point hoist that physically lifts the performer playing the boy. Another **distinctive performer flying** routine is the 'battle' scene, in which each 'warrior' closely mirrors the other's movements on dual straps; if either one is just one fraction out of sync, the knock-on effect would throw their intricate combat dance out of harmony. The battle choreography was precision-programmed using eChameleon automation software and 3D visualisation tool Sculptor and controlled using both Nomad desks.

But the jewel in *Voyage de la Vie*'s crown is the high-tech stage machinery referred to as the 'skating carousel'. This consists of one 'half pipe' and two 'quarter-pipe' laser-guided Explorer stage trucks, the largest of which is 14.5m long and 9.5m high and weighs in at 7,000kg. In the show's finale, these three discrete trucks join together seamlessly mid-stage to form a composite stage within the stage – a 14,000kg, rotating platform.

Stage Technologies Explorer stage wagon first broke ground in London's West End in 1994,

**Nomad control desks at *Voyage de la Vie* (above left); skating carousel steelwork in production at Delstar Engineering (above right)**



Aurelia Cats © 2010 Resorts World at Sentosa Pte Ltd



driving scenery towers onstage in Martin Guerre. Now a far cry from its first prototype, Explorer 2 has been reinvented for the new technological age of theatre – a cutting-edge wireless truck with a positioning accuracy of around 10mm. Modern trucks are no longer bound by the constraints of straight lines and right angles; Explorer 2, for example, consists of two steerable drive wheel cassettes built into the two ends of each truck, allowing it to be steered around curves.

The perfect complement to the free-form truck is Sculptor software, which allows operators to plot direct point-to-point lines with translational and rotational targets and also to generate curves, rotations and speed profiles. This enabled set designers to play with a whole host of creative concepts such as the 'Harley spin', in which a truck carries a lift and revolve for a Harley and handstand act; the spinning truck and upper platform are co-ordinated to keep the handstand artist and the Harley continuously facing the audience.

### Specialist contractors

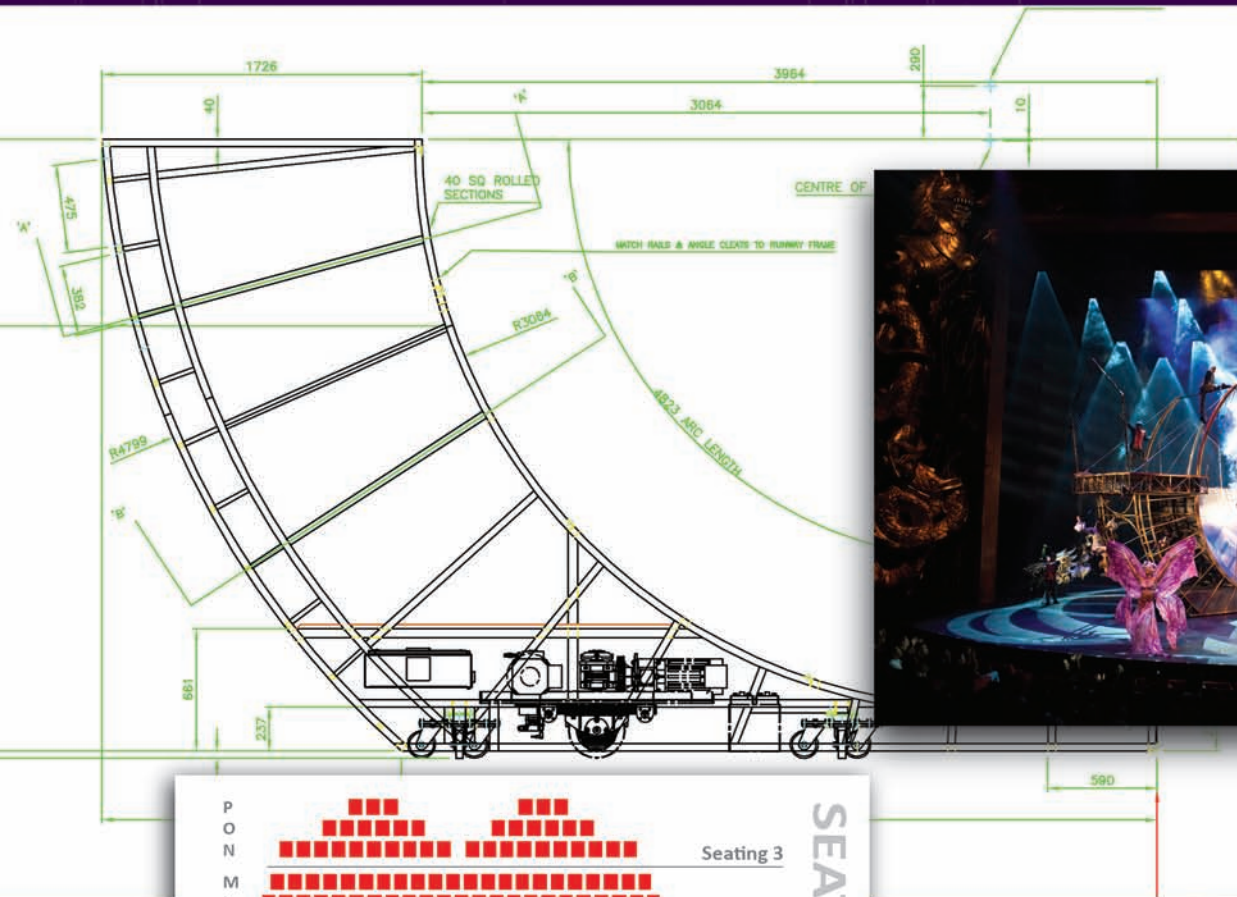
Paul Cockle, line producer on the project for The Generating Company, talked about the role of the various specialist contractors in helping Resorts World Sentosa to bring the show to life. "As with all the best collaborations, *Voyage de la Vie* grew out of technical teams from different disciplines all coming together on common ground," he said. "Stage Technologies and Delstar Engineering designed and manufactured the winches, rigging, automated scenery and all the large structural elements of the set. Terry Murphy scenery completed these large scenery items and White Light installed the lighting and sound equipment. Arina Hogan, based in Singapore, also delivered a number of scenic items that weren't automated and we were all delighted to work with them.

"The Generating Company ran an exacting procurement process for the project and it was great to see that groups that began life in the UK are running with the front of the crowd competing in international services, all the way from design and creation through to production engineering and installation. The show is playing to standing ovations and continues to develop as a world-class international production." ■

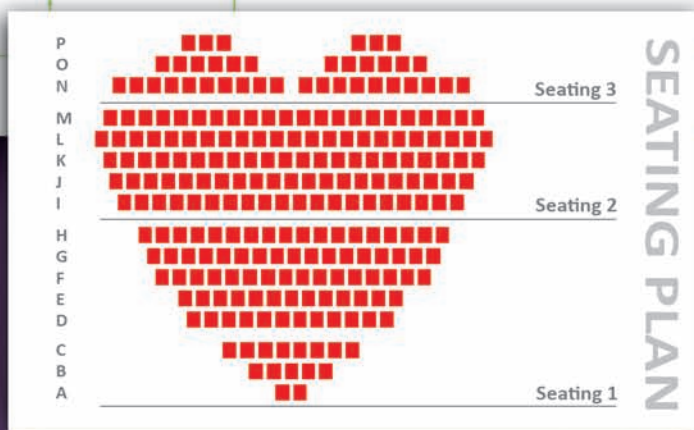
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# American dream

After many years of successfully installing its stage technology solutions in Europe and Asia, SBS Bühnentechnik has now set its sights on the American market

**O**n 24 May 2010, German firm SBS Bühnentechnik established itself as a world force in stage technology on the American continent when the world-renowned Teatro

Colón in Buenos Aires, Argentina, opened for business again after undergoing four years of renovations. The German company contributed its Costacowin stage control system, an easy-to-operate, high-tech solution that controls the 55 point hoists and 34 bar hoists in the upper machinery of the venue. The core element is the main Scout Eagle console, supplemented by two Scout Milan mobile consoles and two radio-controlled Scout Hawk Radio consoles.

In the meantime, the Costacowin system is controlling more than 2,000 drive systems worldwide and the system allows control commands to be visualised in 3D within milliseconds. This control system enjoys an excellent reputation among theatre professionals and Eric Witzke of the Berliner Ensemble theatre says: "What makes the control system special is its intuitive operator interface and quick programming capabilities, particularly the ability to make quick changes during rehearsals."

## Decisive factor

Dresden-based SBS had already delivered stage control elements to the Teatro Colón in 1926 and 1932 and this was a decisive factor in it being chosen for the latest project. The company also has an excellent reputation in Europe, Asia and the Arabic world, with many outstanding venues in these territories equipped with SBS's sophisticated technology.

The start of the new millennium was a turning point for SBS. Until then, the 136-year-old

business had been predominantly operating in Europe, where it established a good reputation as a steel and mechanical engineering company, specialising in stage technology. But at the start of the millennium, the company restructured itself as full-service provider, offering stage technology, mechanical engineering and control systems all in one. SBS strengthened its operation by opening a state-of-the-art machine manufacturing centre in 2002. The production plant is huge, designed to accommodate the largest rotary lathe ever built, and this investment allows parts, products and systems – even units weighing 20 tonnes or with unusual dimensions – to be manufactured with the highest precision.

What SBS needed next was a unique project of international importance to prove it could handle the most challenging requirements. At that time, international tenders for the world's largest theatre construction project, the Chinese National Theater in Beijing, were being submitted. SBS won the contract and constructed, delivered and installed a first-rate cylindrical revolving stage for the playhouse in the National Theater. Thirteen square and two rectangular double-storey elevators operate inside the revolving stage, driven – over 6.8m – by a linear hydraulic drive. The square elevators are controlled completely separately, without touching the neighbouring elevators or the supporting steel construction, and all the elevators feature automatic or manual pit openings. The upper machinery consists of 61 bar hoists (16 for lighting) that move the cyclorama, back and side stage. There are 45 vertical drum lifters, each of







**The Chinese National Theater  
in Beijing**





**The Royal Opera House in Muscat (above) and the National Convention Centre in Hanoi (below)**

which is 2.5m long and 162mm wide. The hoists are positioned 20mm apart and feature DMS shear-force transducers for measuring loads. The 45 bar hoists are positioned above the side stages to save space.

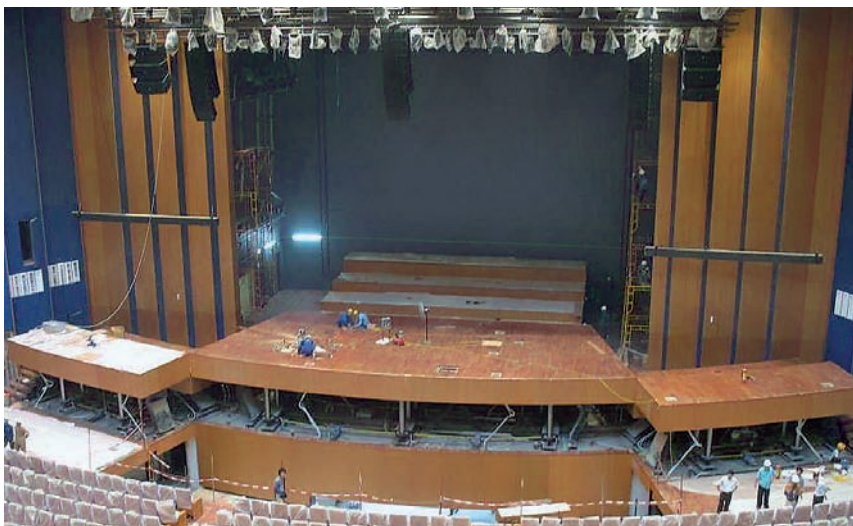
The revolving stage at the Chinese National Theater in Beijing was an important achievement for SBS as it encouraged many other developers to sign up the firm for projects. Contracts for stage technology projects in Chinese cities such as Hangzhou, Henan, Shanghai and Wuhan followed within a few months, and this led to interest from the Asian part of Russia, Vietnam, Uzbekistan, Oman, Lithuania and Belarus. The growth in these new markets brought in additional work to supplement SBS's traditional territories such as Hamburg, Basel, Copenhagen, London and Berlin. The company also provided an elevator platform for the opening ceremony

at the 2004 Olympic Games in Athens.

While theatres and opera houses are the usual kind of venues in which SBS works, major conference venues such as the National Convention Centre (NCC) in Hanoi offer a different challenge. Here, the focus is less on revolving stages, backdrop hoists or elevator platforms, but on elegantly transforming a large auditorium within the space of a few minutes. The NCC auditorium has a capacity of 3,600 and sometimes needs to be divided by an acoustic partition. SBS constructed and delivered this unique partition, weighing 75 tonnes, with electric motors to move the 44m-long and 10m-high steel construction, lifting or lowering the structure by as much as 8m.

SBS is currently working on the Royal Opera House in Muscat, a key project to celebrate the 40th Renaissance anniversary of Oman. This job requires extremely complicated technical solutions and room-transforming technology as the Royal Opera House is aiming to exude an impression of uniqueness and changeability by means of a changeable entrance area and a movable concert shell. This allows a high-quality theatre auditorium to be transformed into a concert hall with outstanding acoustics within minutes, for which 525 tonnes of steel have to be moved.

After 10 dynamic years in Europe and another 10 years of impressive growth in Asia, SBS has grown from 118 to 178 employees, and from sales of almost €20 million to more than double that amount, while quadrupling its exports. And now following the success of the Teatro Colón in Buenos Aires, SBS is ready to take on America. ■





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Mariinsky Theater, St. Petersburg  
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China National Grand Theater Peking  
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**SBS BÜHNENTECHNIK GMBH**



# Stage craft

Hoac's turntable technology is at the heart of a new rehearsal centre for both opera and theatre in Stuttgart

In 2008, the city of Stuttgart in Germany made the decision to centralise its opera and theatre rehearsal spaces. A former industry hall in the city's suburbs was chosen as it was located exactly half way between the opera and theatre, and the huge space used for storage of set designs. Plans for the six rehearsal stages and a new studio stage with 150 seats for performances were completed by contractor Dibag within two years.

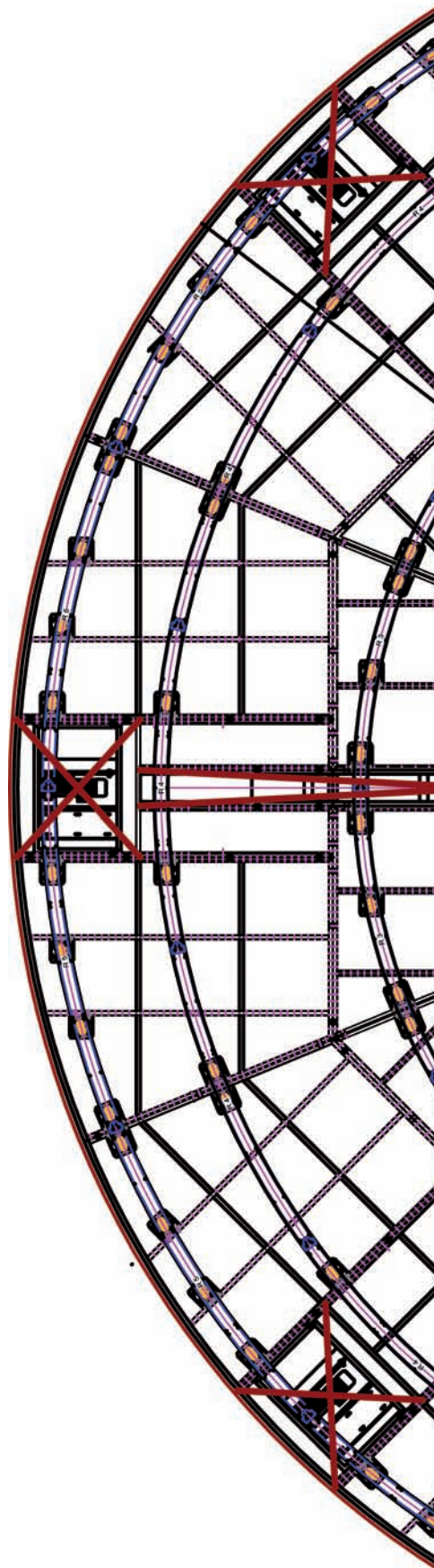
For opera productions, three rehearsal rooms will be available, the largest one measuring 34 x 26m and with the same dimensions as the main stage plus the first eight rows of the audience. The second one will be 26 x 26m – the same size as the opera stage plus the first row of the audience.

The third one at 18 x 18m will be exactly the same size as the main stage in the opera house. For theatre productions, there will also be three rehearsal rooms, with the largest one measuring 28 x 18m, the second one 28 x 16m and the third one 18 x 16m.

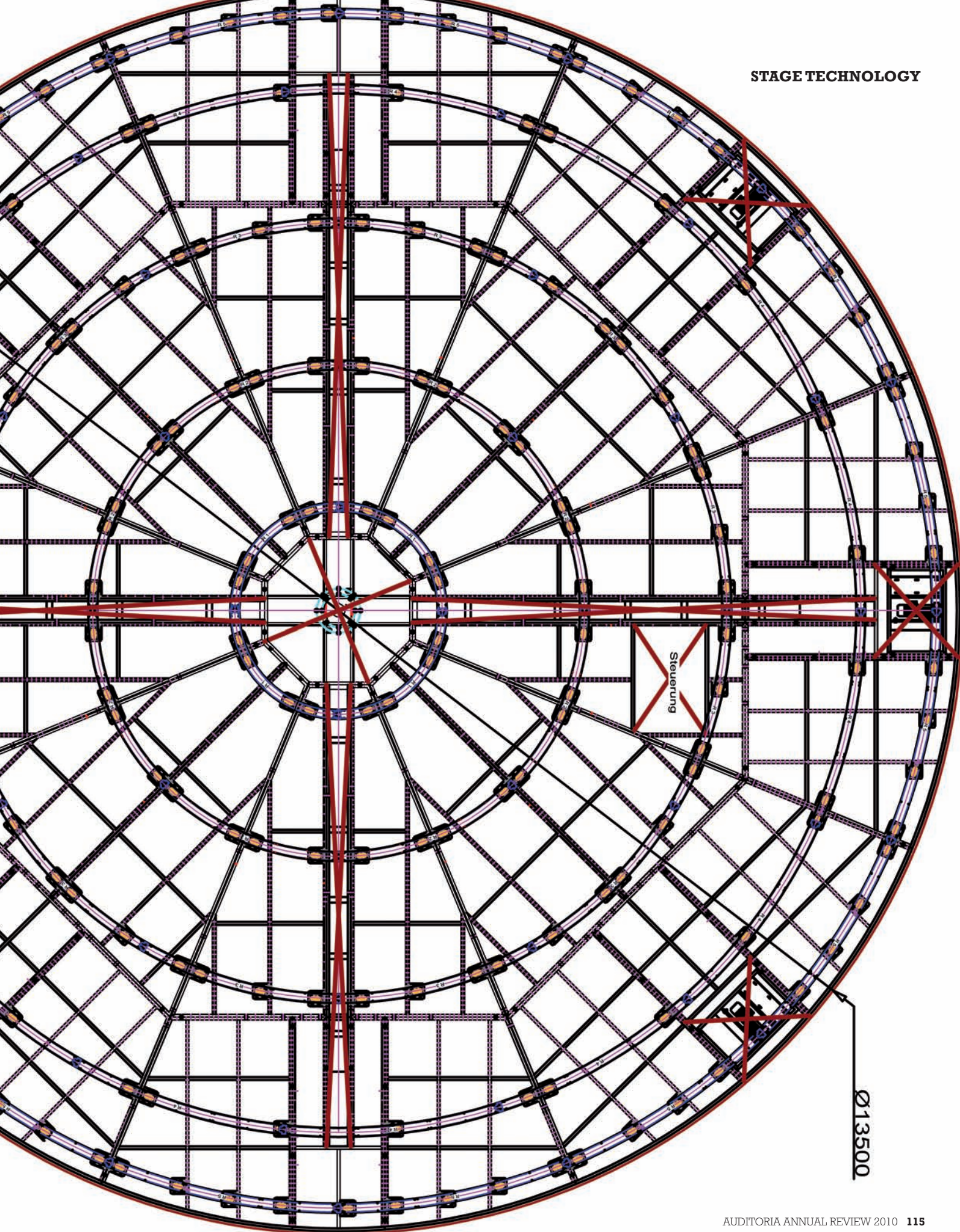
The new studio stage will measure 20 x 15m including a foyer, and will have no fixed audience seating to allow flexibility seating arrangements. All stages will be equipped with flybars, with load capacities varying from 500kg down to 250kg in the studio stage. For ease of movement, the biggest stages of the opera and theatre rehearsal rooms will be equipped with turntables that are permanently set up on the concrete floor. The contract for manufacturing and installing these turntables and a lighting bridge for the



Hoac's turntables are an integral part of the new rehearsal space











**The new rehearsal centre is  
due to open in October 2011**

studio stage was put out to tender, and was won by German company Hoac, which has worked in this field for more than 25 years. As well as being well-known for its aluminium frame systems, Hoac has a great deal of experience in the construction and manufacture of all kinds of turntables and stage wagons. The main turntable for the rehearsal stage of the opera will be 13.5m wide, the next smaller one for the theatre rehearsal stage 12m wide, and the turntable for the studio stage 8m wide.

The basic structural features of all three constructions will be similar. They will all be covered with 27mm-thick plywood painted black to give a uniform backdrop to the stage. To enable efficient and quiet rotation of both turning elements, Hoac will place steel rings

on the concrete ground, to set the level for the casters of the turntables. The steel rings are fixed by injecting a high resistance mortar that has to be left to dry for 48 hours before the installation of the turntables can begin. The overall height – including the 27mm wooden top layer and casters – is 200mm. The static load capacity of both turning elements is 500kg per square metre and the dynamic load capacity is 250kg per square metre. For the welded aluminium frames, the 140mm-high Hoac-Zarge 16½” model is being used.

Six decelerated friction wheeled motors, each of them equipped with 0.75kW, will be placed in 90° positions in the 14m-wide turntable and powered through the slip ring. The other turntables run using four motors each. The turntables are controlled by electrical frequency converters embedded in the main control system and emergency stops can be carried out by simple forward and backward movements. The speed ranges from 0.01m/s up to 1.2m/s.

The studio stage will also be equipped with a lighting bridge, 15m-wide and 8m high, which can be driven electrically both forwards and backwards, and is connected to the main control system.

The finished rehearsal centre will open in October 2011. ■

[www.hoac.de](http://www.hoac.de)

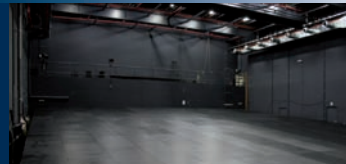
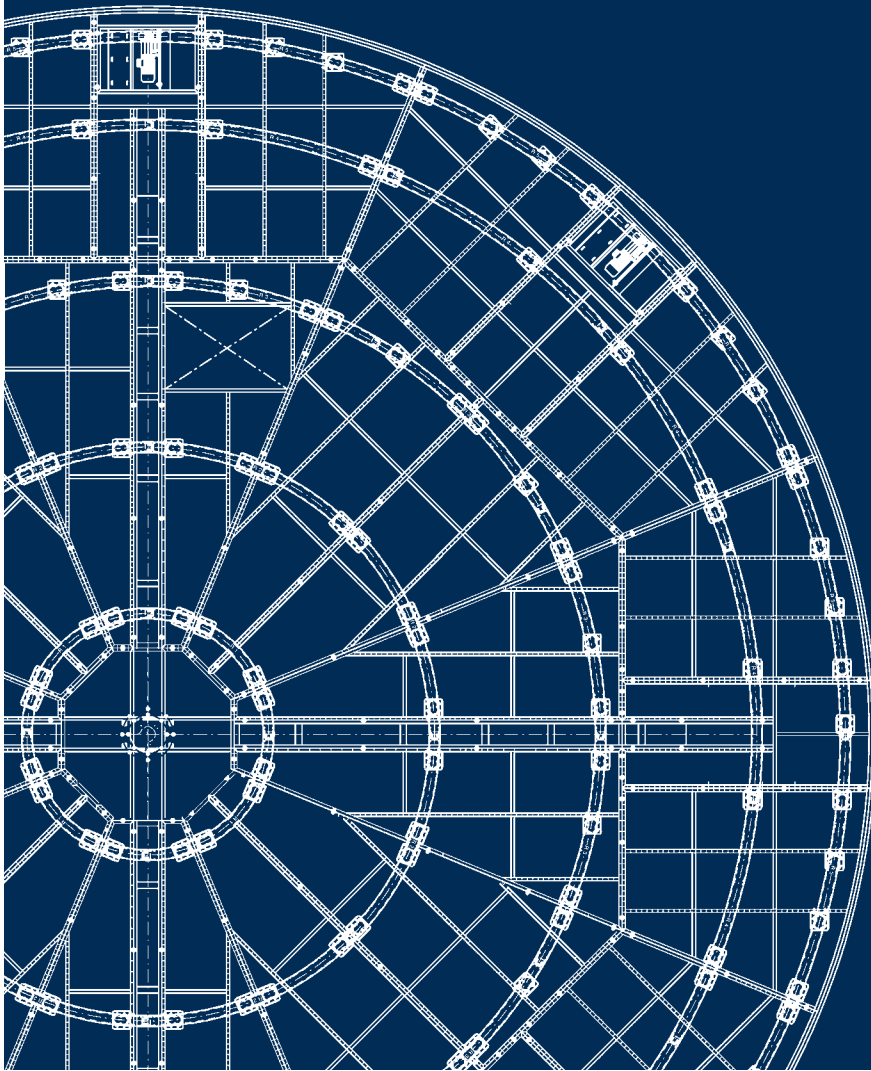




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STAGES



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SET DESIGN



# Adjust your set

Waagner-Biro provides an update on recent installations of its stage equipment at venues in Iceland, Norway and Spain

**W**aagner-Biro Austria Stage Systems is an established expert in providing technical equipment for opera houses and theatres, and offers its customers a wide range of products and services designed to ensure that even rapid changes of scenery or spatial configurations can take place smoothly. Modern concert halls must be suitable for a large variety of music, and their stage equipment requirements are becoming ever-more demanding. Design engineers and acousticians try to achieve the best sound by introducing acoustic devices to adjust the acoustic hall volume and the hall reverberation in

various frequency ranges. The elements used to allow for such adjustment are acoustic banners, canopies and reverberation chambers. Waagner-Biro provides overall solutions, from engineering to installation of the complete system including the latest control technology and the company says its success lies in its flexible approach to complex problems and this is reflected in the company's motto: "We realise visions".

## Harpa, Reykjavik

Waagner-Biro has recently been working on the National Concert and Conference Centre in Reykjavik – to be called Harpa – which was designed by leading Danish architect Henning



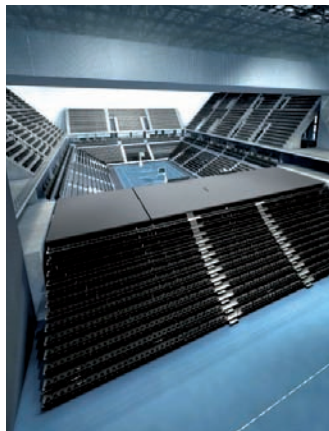
Bringing in the canopy winch at Harpa











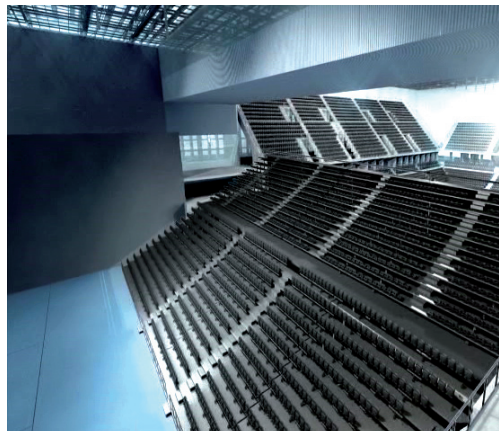
**Reyno de Navarra Arena in Pamplona, Spain**



Larsen. When completed, it will consist of a shoebox-shaped concert hall for an audience of around 1,800, a rehearsal hall with room for 450, and a conference hall for 750 people. The demanding acoustic machinery, which represented a major challenge to the design engineers, will consist of 267 rolled acoustic banners in lengths of up to 18m, 78 adjacent reverberation chambers doors and 35 tonnes of heavy, mobile acoustic canopies. All these devices will be controlled by Waagner-Biro's sophisticated CAT control system.

## Stavanger Concert Hall

A further example of Waagner-Biro's expertise will soon be seen at a new concert hall in Stavanger, Norway. In 2011, three years after Stavanger celebrated its status as European Capital of Culture, the doors to the new Stavanger Concert Hall will open. The aim is to create a music venue containing two performance halls with excellent acoustics. The Orchestra Hall will seat 1,500 visitors and the multipurpose hall will have a standing capacity of nearly 2,000. The venue will also include a large amphitheatre suitable for outdoor concerts. The concert hall is acoustically isolated in a way that enables it to simultaneously stage a symphony orchestra in one hall and, for example, a rock concert in the other. In the new concert hall in Stavanger, Waagner-Biro will install eight canopies weighing between 14 and 30 tonnes. The surface area of the canopies varies from 76m<sup>2</sup> to 140m<sup>2</sup>, adding up to a total surface area of more than 800m<sup>2</sup>.



## Reyno de Navarra Arena, Pamplona

In line with the venue's multifunctional purpose, the new arena's seating must be suitable for a variety of sporting events, as well as congresses and trade fairs. As a result of its expertise in the field of innovative retractable seating, Waagner-Biro won a contract to equip the new multifunctional arena in the northern Spanish city of Pamplona with 5,600 seats on automatic telescopic stands and including folding mechanisms. Among the most impressive design features are the four double-tiers, with main platforms of 11.2 x 14m and a total surface of 627m<sup>2</sup>, as well as four, secondary integrated platforms with a tilting function.

Waagner-Biro's innovative solution allows quick adaptation of the space available for diverse requirements. Using the platforms and telescopic stands, it is possible to quickly create a second playing area adjacent to the main one. This provides ideal conditions for the Basque national sport of pelota, a ball game that is played in a number of variations. Pelota requires a court – or frontón – 35m long and 15m wide, and using the versatile seating system this can be arranged quickly and easily as required. Conditions are also perfect for spectators, as the second level of the stands is rotatable and can therefore either face the main or the secondary playing area. In addition, should the entire arena be required, as is the case with trade fairs, the entire stand structure can be lowered into the floor. ■

[www.waagner-biro.at](http://www.waagner-biro.at)





# waagner biro we realise visions

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# Flexible thinking

In the world of small to mid-sized performance spaces, the flexibility provided by retractable seating and stages is key

Continuous innovation is just as important as flexibility in today's climate. Every auditorium designer's vision will be different, according to the client's aspirations. And the specialist contractor seeking to serve the design team has a never-ending challenge. The variety in scope of projects and geographical range can be almost bewildering. The specialist architect and theatre consultant will frequently range over an international field. They will be closely engaged with the venue's purpose. Perversely it is quite likely that the main contractor, frequently operating locally, will never have built a theatre before. It is fairly certain that the site managers will have no specific experience. Part way through the project will come expressions of surprise at just how particular the demands of a performance space are. The ability of the subcontractor to bridge interfaces between structure, mechanicals, seating, guardrails and the like can play a useful role in realising a design that might otherwise contain a few headaches. The need to think a little way outside the box is the unique selling point. Liaison with the contracting team is a given. Making a profit can be a pleasant surprise!

**Nivoflex Airstage at Tempe Center for the Arts, Tempe, Arizona (below); The Round, Lancaster (opposite, top left); Mark Taper Forum, Los Angeles (opposite, top right); Hampton School, UK (bottom two pictures)**

With post-crunch prospects improving (albeit slowly), media industries can expect growth. Projects are delayed, but still moving forward. Retrenchment over the past couple of years has been common, but Steeldeck has invested heavily in terms of both CNC machinery and intellectual property to protect new products.

Signs of recovery evident at London's PLASA show and the LDI exhibition in Las Vegas have yielded results across the board, with products ranging from the 25-year-old signature Steeldeck platform, to the brand new BPack mobile retractable. A staple product in the Steeldeck offering is the Nivoflex AirStage platform by Bühnenbau Schnakenberg (Steeldeck is its UK and US agent). But enhancements specific to Steeldeck are the rotary connectors, integral fascias (which eliminate the need for chairstops) and gas-spring assistors, which accommodate the heavy timber overlays beloved of architects. Equally, the eponymous Steeldeck platform now sports the ForkDeck adaptation for mechanical handling, the EasyOut additions for use in an orchestra pit situation and the WedgeLock post mountings (by designer Giles Favell). All deceptively simple... and very effective.

There has been further development of Steeldeck's retractables: the latest BPack boasts air-powered lifting castors, tapered units for in-the-round set-ups and modifications to permit rough handling, even by fork lift trucks. The Mirage bench (by designer Christopher Richardson) now folds neatly into a riser space achieving row-to-row height of 285mm or less... not easy to do with a premium seat where the emphasis is on comfort rather than compactness.

The final verdict on a new product is always given by the end users: the customers, who, as it were, vote with their feet. Either "they never use it"... the ultimate downer; or "they use it all the time"... the equivalent of passing the audition! ■

[www.steeldeck.co.uk](http://www.steeldeck.co.uk)









# Software solution

Investing in the right venue management software can reap huge rewards both in terms of efficiency and profit

**The Royal Dublin Society dining hall (opposite, top); view of the concert hall from the stage (bottom); Ungerboeck's Mobile CRM application allows accessing CRM data from smartphones**

With the worldwide economy recovering from the downturn, the meetings and events industry can expect a boom in demand for meeting and event space and venues such as performing arts centres need to be ready for this. The right tools are essential to organise internal resources as effectively as possible. "With a professional venue marketing and management system like Ungerboeck Software, your events will run more smoothly and at a higher profit margin," explains Thorsten Kolbinger, managing director at Ungerboeck Systems International, EMEA. "It covers all the required functionalities in one integrated system to maximise the utilisation of space, while simultaneously decreasing costs."

The Royal Dublin Society (RDS), one of the most versatile venues for exhibitions, conferences, and major entertainment and sporting events in Ireland, has been using Ungerboeck software since 2000. "With over 20,000m<sup>2</sup> of space, including various exhibition and concert halls, as well as other meeting rooms, we were definitely in need of a comprehensive software solution that could help us manage our venue more efficiently and set up standardised processes within our organisation," says Adrienne Clarke, commercial manager at the RDS. "Most important for us was – and still is – to have one single

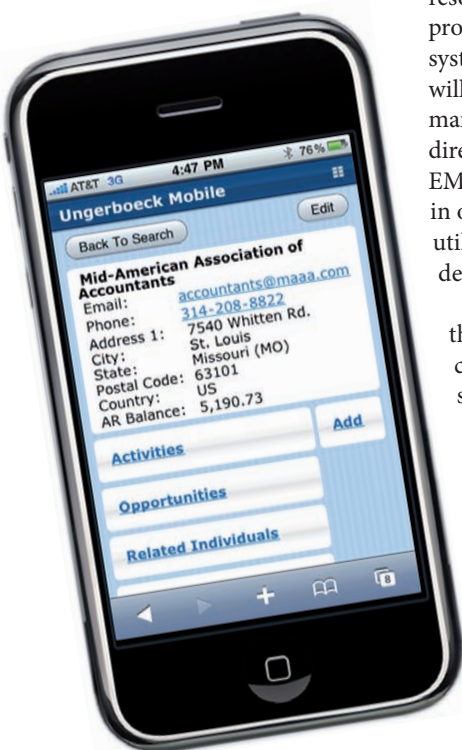
system accessible by all departments, including a diary/booking calendar to enable staff to easily view all details of an event including setup, catering, all correspondence with the client and up-to-the-minute accuracy for billing purposes. The booking system serves as the central communication and planning tool and allows users to easily maximise booking potential."

With the built-in Ungerboeck yield optimisation tool, the number of events a facility can simultaneously handle can be increased, thereby increasing revenue. Depending on variables such as profit contribution and resource constraints, the software will help venues prioritise different options and weigh-up opportunities between competing events. In addition, Ungerboeck software allows performing arts venues to determine which areas are underused and which are consistent revenue generators.

Sales and marketing services for existing and potential customers are also strengthened by integrated CRM functionalities. Customer and event information flows seamlessly to and from sales, services and the operations team, allowing all staff to be privy to the same information. "Ungerboeck's customer relationship management empowers our sales team with an excellent overview of the sales pipeline and the creation of sales forecasts. Automated follow-ups, reminders and communication histories ensure that prospects and leads are never dropped or lost," explains Clarke. "CRM capabilities such as integrated marketing campaigns or standardised templates help us to save time and focus on our core business – increasing sales and delivering additional value to our customers."

## Reporting system

But running a successful performing arts centre is not only about selling and scheduling. Keeping your venue on the right track makes complete reporting and control indispensable. Ungerboeck's system offers executive-level information on almost everything – from sales figures, to customer booking history and trends. At the RDS, the marketing department uses these reporting functionalities to access valuable reports of trends, client lists and booking patterns, but also to monitor budgets on a constant basis and to forecast future revenues.







SOFTWARE





## SOFTWARE

UNGERBOECK SYSTEMS INTERNATIONAL

Looking ahead at what the future might bring and reacting accordingly is what differentiates a first-class venue from an average one. Trends and their possible effects – negative or positive – on the events industry need to be investigated and planned for. “What executives sometimes forget is that management software plays an important role in making sure their venue is well-prepared. There are a lot of solutions out there that are in the same state as they were at the time of purchase,” says Krister Ungerboeck, president at Ungerboeck. “In recent years, we have invested a vast part of our resources in developing our software, to ensure it meets the requirements of the market and turns the latest industry trends into powerful software functionality.”

### Innovative technology

An example of the company's innovative approach is Ungerboeck Mobile, which delivers mobile CRM functionality that allows staff working externally to access all the information they need while out of office. Sales people can enter and maintain CRM data directly from their smartphones while waiting for appointments, commuting to and from work, or in between phone calls. This also ensures that the contact information at your office is the same as the information your sales people are using on the road.

“We’ve seen a notable increase in the interactivity between attendees and event organisers before, during and after an event,” notes Ungerboeck. “With the emergence of various internet sites that are focused on user-generated content such as Facebook, LinkedIn, as well as blogs and forums, the events industry has



## Interview: Adrienne Clarke, RDS

### What kind of events do you host at the Royal Dublin Society?

As a multipurpose venue, we host more than 400 events a year, including exhibitions, shows, conferences and seminars, competitions, recitals and concerts.

### The RDS has a proven track record in staging successful world-class entertainment events – do you have special facilities for these?

Yes, for concerts and public shows we offer a 1,000-capacity concert hall, a purpose-built hall for up to 5,000 people and a pavilion that can hold 7,000 people. In addition the main area, which can accommodate up to 35,000 people, is also available for entertainment and sporting events.

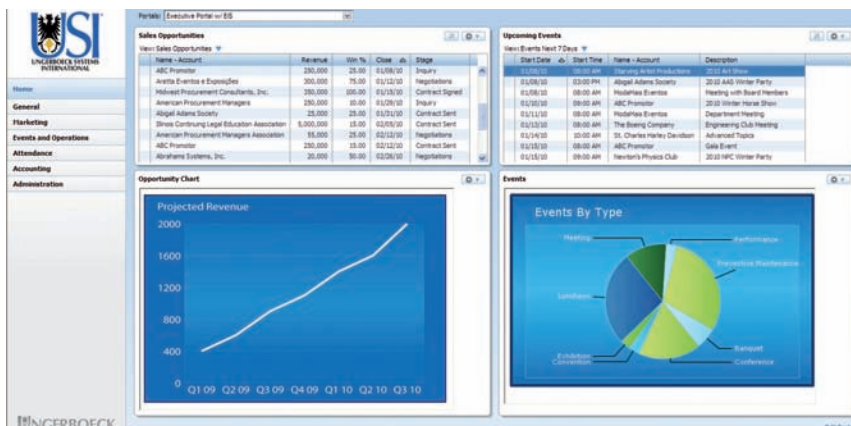
### What is the biggest event held at the RDS?

The Apiamondia World Congress in 2005 was our largest conference so far with 5,500 delegates. In 2012, we will host the 50th Eucharistic Congress with anticipated numbers up to 25,000 people. And our yearly horse show brings in 80,000 visitors.

### Why have you chosen Ungerboeck Software as your ideal venue management and marketing solution?

We evaluated major software providers and concluded that Ungerboeck is the best to manage a multipurpose venue like ours. It contains all the functionalities we need – from booking to budgeting. With Ungerboeck we can manage our event spaces more efficiently.

### Portal screenshot of Ungerboeck's event software (below)



embraced more of the technologies surrounding this.” Nowadays, most events are posted on social network platforms, allowing users to link to groups and even register directly. The benefit to the attendee is clear: all group members can keep in touch before, during and long after an event in order to exploit networking potential. The benefit to the event organiser is apparent as well: with tools such as Ungerboeck's social media, you will lengthen your interaction with the attendee and increase your potential for additional business.

“None of this would be possible without the support of a powerful venue and event management solution such as Ungerboeck's software,” says Krister Ungerboeck. “When deciding on the right solution, performing arts centres should make sure they have a software partner on their side, offering them the latest functionalities needed and regularly transforming trends and new technologies into efficient software functionalities.” ■

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# Friends in high places

High-reaching compact lifts have gone a long way to solving cleaning and maintenance issues at performing arts venues

All performing arts venues need regular maintenance and cleaning, including those hard-to-reach areas above escalators, tall windows and ceiling installations. Simple tasks like window cleaning, changing light bulbs or dusting-off beams become major headaches when the work areas are located 90ft-plus in the air. For these kinds of tasks, a new tool has emerged – the atrium lift: a compact, self-propelled lift that can pass through a single door, and once inside will deploy a set of outriggers, and can elevate people up to more than 170ft into the air. Powered by batteries and light enough to travel over most surfaces, these units have become the weapon of choice in facility managers' arsenals when it comes to indoor access and aerial reach applications.

However, what do you do if you don't have either a door or an elevator big enough to fit the lift through, and a second-floor atrium in need of maintenance? That was the dilemma for the

Hobby Center for Performing Arts in Houston, Texas. Located in downtown Houston, the facility boasts a beautiful lobby area on the second floor. However, in the design phase, nobody thought about access to this atrium and the need to carry out indoor aerial maintenance jobs. The only access would be through a door less than 4ft-wide from the balcony, obstructed by an unmovable guardrail just 5ft from the door opening.

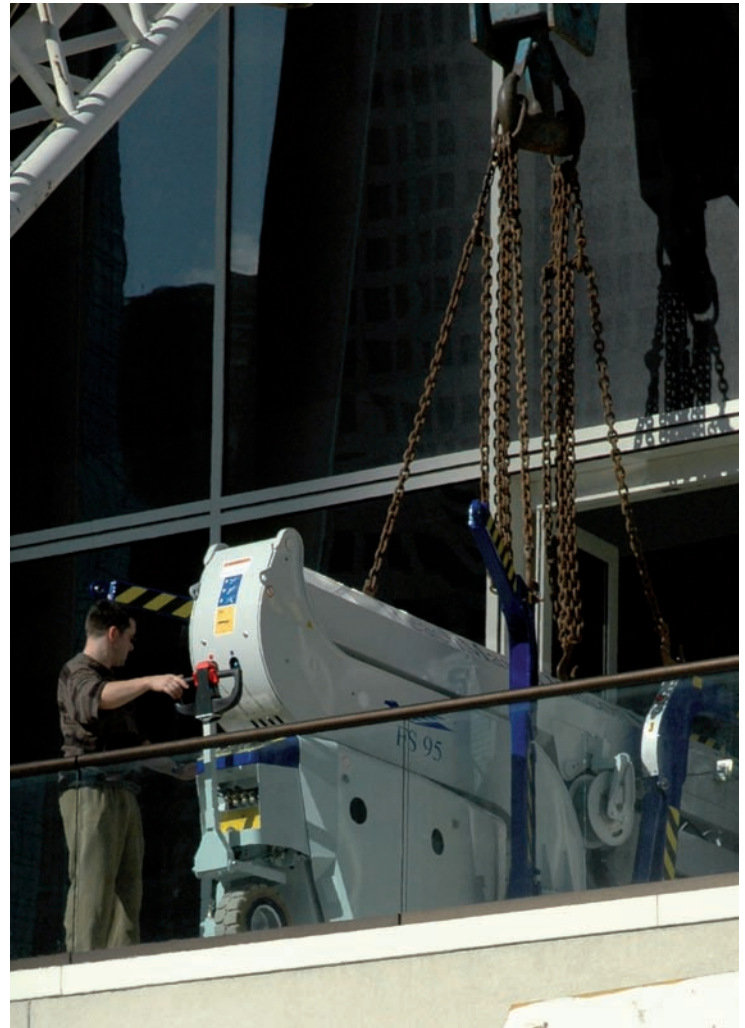
After an on-site inspection, it was determined that it would be possible to hoist a ReachMaster Falcon FS95 lift, made by Danish firm Skako Lift, onto the second floor and over the balcony, using a mobile crane, and without damaging either the guard rail or the door entrance. The trick was to get the correct angle of lift as there was literally less than an inch to spare at any given time of the procedure. Once the unit was lowered onto the floor, a number of tasks could be carried out. One of the main challenges had been reaching out over the two half-oval stairwells at each end of the atrium, leading to the lower lobby floor, in order to carry out lighting and cleaning work above and behind the stairs.

Another concern was the state of the indoor up-lights. Years of dust and grease accumulation had had a noticeable dimming effect, however until now there had been no way to access these lights and carry out proper cleaning and maintenance. The lack of a permanent access system had left this building with no choice but to ignore a significant amount of maintenance issues for years. This all changed with the birth of the compact lift industry. The industry had begun in the late 1970s in Denmark, when

**The only access to the Hobby Center for Performing Arts was through the second-floor balcony door – the lifting angle of the unit was critical for accessing the entrance point**







With less than an inch to spare between the unit and the guardrail, the unit is lowered in through the door and onto the second floor



## MAINTENANCE

SKAKO LIFT/REACHMASTER



**Reaching the areas over the stairs that otherwise could not be serviced**

Skako Lift (then called Falck Schmidt A/S, a lift specialist founded in the mid 1930s) was challenged with the task of producing a lift that was small enough to fit through a 3ft door and reach the then-astonishing height of 46ft. The company came up with the 'spider leg concept', where the lift has a narrow body (less than 3ft wide and 7ft high) and four outriggers that are deployed. Powered by a 24V battery system, the unit was safe to use indoors and was an instant success when first used in 1977.

Today, the work heights of these sophisticated lifts have reached a breathtaking 180ft, and they are in service at venues all

over the world. New features like articulating double jibs enable the 'reach-up-over-behind' applications, and a whole new flexibility has been given to maintenance jobs where there is limited access and considerable work-at-height requirements. And for the Hobby Center in Houston, the very first demonstration of the ReachMaster Falcon FS95 proved to the venue's management that it would now be possible to access areas that had previously been impossible to get to. ■

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# Wired for sound

Moscow City Performance Hall offers its audiences a high-end audio experience in luxurious surroundings

The Moscow City Performance Hall isn't simply a venue for live theatre – it's a live studio audience, broadcast capable, post-production facility that can accommodate 5,000 people, and its flexibility allows it to stage anything from rock concerts to opera, to tennis matches and car shows. The venue sets a new standard for acoustics and the hall configuration creates an environment for CD-quality sound that closely matches the original recording. It also offers excellent production capabilities, both theatrically and musically, that set it apart from traditional halls.

BBB Architects' Brian Brisbin was the partner in charge of design: "The facility provides what is in essence a live studio audience experience with electronically enhanced acoustics and full post-production broadcast capabilities," he says. The hall is essentially an anechoic chamber in which the traditional rules of acoustics are broken down in terms of the direct reflected time differences associated with such large volumes

that create problems for both reverberation and reflective sound distortion. The system has an embedded secondary array of speakers, allowing a programmed time delay to be accomplished through digital signal processing, tailored to the type of music performed. In this environment, the audience won't have to have heard the artist's music before to understand the lyrics.

BBB Architects' approach to such projects was developed while working on venues in the Los Angeles entertainment world. Flexibility is essential – seating tier locations and removable flooring areas allow the hall to be configured for between 2,000 and 5,000 seats, depending on the production. Retractability of the lower tiers means unusual events such as tennis matches, exhibitions and dinners can be staged. In such venues, BBB uses its SmartSeat, a fully interactive artistically enhanced system with screens mounted on the back of each seat. The performance can be viewed on the screen though a wide range of camera angles, and there's the added bonus that guests can order food,







beverages and other items online with a credit card. Brisbin says, “Essentially these are ‘video opera glasses’ that allow you close-ups without having to rely on large screens.”

The iconic Moscow City Performance Hall is the centrepiece for the new Civic Centre, which also includes a hotel and retail areas. This complex project sits on top of five floors of infrastructure, and planning had to take into

account a railroad station, shipping, parking, lower concourse levels and connections to local transport links. The venue hopes this mixture of high-end audio technology and classy design concepts will earn it a reputation as a prominent performance hall for popular music and performance acts throughout Europe. ■

[www.bbb.ca](http://www.bbb.ca)

**Far left: SmartSeats offer the audience a fully interactive experience**



# Midwest gem

CSO Architects helps polish the performing arts landscape in central Indiana, USA

Providing its region with a cultural attraction of world-class quality and scale, the new multivenue Center for the Performing Arts in Carmel, Indiana, will open the first of its facilities in January 2011, when it inaugurates its grand concert hall, The Palladium. The Palladium, and the complex as a whole, will serve as a major destination within central Indiana.

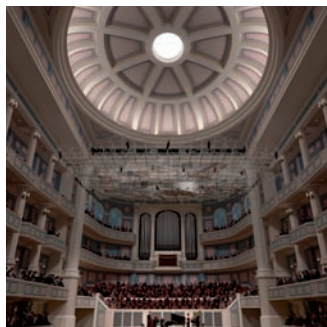
With its gracious and elegant form, the 1,600-seat, 14,000m<sup>2</sup> Palladium is the only true concert hall in the region and will feature an extensive schedule of concerts and events, including performances by the Center's artistic director Michael Feinstein. The Palladium will also be the new home of the Feinstein Foundation for the Preservation of the Great American Songbook, making the Foundation's extraordinary, museum-quality archive available as never before to scholars and the public.

The performing arts complex, which will also include a 200-seat studio theatre and a 500-seat proscenium theatre, is the cornerstone of the Carmel City Center, a US\$300 million mixed-use redevelopment championed by long-time Mayor James Brainard. While providing the residents of Carmel with a visionary blend of urban density and suburban location, City Center will also serve as a valuable resource for the citizens of nearby Indianapolis.

## Project collaboration

Indiana-based CSO Architects collaborated with architectural design firm David M. Schwarz Architects of Washington DC and with acoustician and theatre planner Artec Consulting of New York City to create the Palladium concert hall. "We are honoured to be part of an incredible design and construction team that has produced an edifice that is truly a once-in-a-career type project that has incorporated the thoughts and ideas of a remarkable group of professionals," said CSO principal in charge Dan Moriarity.

Such collaboration has become a hallmark of CSO's success. "CSO has a profound knowledge and understanding of the detailed workings of



**The interior design of the concert hall was influenced by neo-classical architecture**



performing arts venues. They are simply great at all the coordination demanded in these ultra-complex buildings," said Willem Brans, who worked as an arts consultant on the project. "I know that every member of the design, acoustics, theatre planning, engineering and construction management team, not to mention the owner, enjoys the collaboration with CSO. We have all learned from them."

The four-fronted, symmetrical design of The Palladium, massed around the domed central space of the 'single room' concert hall, was inspired by Andrea Palladio's Villa Capra, La Rotonda (1566). The hall's exterior detailing was inspired by the Viennese Secessionists of the early 20th century, while the interiors were influenced by the neo-classical works of 18th-century Scottish architect Robert Adam, a devotee of Palladio. The hand-carved limestone façades create a structure that combines a traditional vocabulary with subtle contemporary references, resulting in a timeless design.

A raised, colonnaded portico on the south façade faces Center Green and creates a grand entrance at the top of the orchestra level. The east and west façades provide ground-level entry, allowing barrier-free access to the lower orchestra level.

The Palladium is based upon the traditional 'shoe box' shape concert hall with high ceilings and massive, sound-reflecting walls. However, the room itself is symmetrical from side to side and front to back, creating a central volume that is topped with a cylindrical dome with an oculus in the middle. The two oval spaces that fuse into the central volume are also symmetrical from front to back with identical outermost walls and ceilings surrounding the half dome. The Palladium is one of the few concert halls that play into Palladio's multiple use of symmetry.

With approximately 800 seats located on the main floor, The Palladium will provide audiences with an acoustically and visually intimate setting for a wide variety of music performances. More than 600 patrons will have access to multiple-level box seats with private anterooms and the





stage can accommodate up to 120 musicians. To provide intimacy and a sense of being enveloped by sound, side ledges for audience seating and acoustic reflection are provided at two levels.

“The Center for the Performing Arts will allow us to present the finest artists from around the globe, as well as provide much-needed space for local and regional arts organisations, fostering artistic development and community engagement,” said executive director Steven Libman. “Through their support, Mayor Brainard and the members of Carmel’s City Council have given an extraordinary gift to the residents of Carmel and the region.” ■

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DESIGN

The Palladium offers an acoustically and visually intimate setting



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## DESIGN

DIAMOND AND SCHMITT ARCHITECTS

# A Russian rhapsody

Canadian architects build the first opera house in Russia since the Tsars



**The impressive lobby of the New Mariinsky Theatre in St Petersburg**

Creating a stage for the next generation of performers and patrons at one of the world's most acclaimed cultural institutions is a tall order. Yet the challenge is being met with ingenuity, a dash of diplomacy, and, above all, sensitivity when it comes to the historic commission to create the New Mariinsky Theatre in St Petersburg, Russia.

Toronto-based Diamond and Schmitt Architects is well versed in the world of auditorium design, with major halls completed in Washington DC and Detroit, and Montreal's new symphony hall nearing completion. But the firm won the international competition for Mariinsky on the strength of its acclaimed Four Seasons Centre for the Performing Arts, the first purpose-built opera house in Canada.

"The Toronto opera house gave me the confidence that Diamond and Schmitt Architects would do well on our project as well," said general director of the Mariinsky Theatre, Valery Gergiev.

The project sees principal Jack Diamond and his team on a transatlantic commute for regular meetings with the famed conductor and local partner KB ViPS. Being adjacent to the original Mariinsky Theatre (1860), where the likes of Tchaikovsky, Prokofiev and Diaghilev premiered their works, the new hall, says Diamond, requires a respectful approach to ensure it does not upstage its venerable predecessor. At the same time, he wants to bring a new level of engagement and vitality to the venue and its surroundings. "The trick for us was to find a contemporary expression of the historical principles of that marvellous city."

Above a fenestrated masonry base that is consistent with existing buildings and punctuated with generous bay windows, a glass canopy and dramatically situated amphitheatre define the roofline. For the interior, light-filled lobbies and grand staircases are set against an inviting glass front elevation. The 1,800-seat auditorium takes the traditional horseshoe ring and brings it all the way to the proscenium, while creating a contemporary design. A VIP box in the first tier references the days of the Tsars, yet in a new hall that is very much rooted in the 21st-century. The warmth of the space is enhanced by the use of wood throughout, including a suspended wood floor that will create a sense of movement, engaging the spectator to feel the music with their feet. The ceiling is cast in plaster and shaped for the acoustic requirements of the room.

## Music maestro

Working with consultant Fisher Dachs on the interior and Müller-BBM for the acoustics, Diamond and Schmitt will address the maestro's demands for a solid, unchanging acoustic from which he can extract the full range of sound from his players with little more than a flutter of his





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baton-less fingers. “The orchestra is an instrument, the hall is an instrument. These two instruments together make music,” Gergiev said.

The new theatre will be home to the Mariinsky Opera, Mariinsky Ballet and Mariinsky Orchestra. Back-of-house facilities includes six stages and six rehearsal rooms to accommodate the busy schedules of these renowned companies.

As work progresses towards a target opening in 2012, Diamond reflects with a mix of reverence and well-regarded experience that has guided him so far. “This commission sends a strong signal that Canadian architects can work on the most demanding projects on the world stage. We are enormously grateful for the confidence the Russian Federation has put in our ability to produce a landmark for the new Russia and for the performing arts everywhere.” ■

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# Diamond and Schmitt Architects

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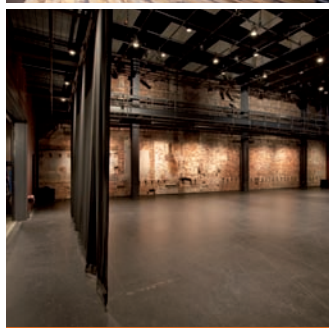
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New Mariinsky Theatre, St. Petersburg, Russia



# Paramount importance



Emerson College's expansion has given Boston's theatre district a new lease of life

Once a face in the crowd of colleges and universities offering theatre training in Boston, Emerson College moved its attentions from Back Bay to downtown a decade ago, re-imagining the city's shuttered theatre district as the home of its new campus. Working closely with the city, Emerson developed a series of projects – the Cutler Majestic Theatre renovation (2002), the Tufte Performance and Production Center (2003), and the recently opened Paramount Center. The Paramount caps the creation of Emerson's core theatre campus. Resident in the formerly blighted area once known as 'the combat zone', the college is a force in Boston's revitalised live performance district.

The A&E team behind these projects has been consistent from the outset. Under the leadership of Emerson's former vice president of finance and administration, Robert Silverman, architects Elkus/Manfredi and theatre consultant

Auerbach Pollock Friedlander participated in the re-visioning of the Theatre District. According to Steven Friedlander, a principal at Auerbach, "the Paramount Center is a major step in Emerson's commitment to downtown. The sheer size and critical mass of this project – with performance education as an anchor – is unusual in an urban setting. Its live theatre and media facilities are unmatched anywhere else in the United States".

The depth of this commitment was further demonstrated with the inaugural season of ArtsEmerson, the college's programming arm, presenting 17 professional productions with the Paramount at the hub of activity. Although the historic 1,186-seat Cutler Majestic Theatre is the largest of the season's four venues, the other three are in the new Paramount Center – a facility described by the college as a "first-of-its-kind, mixed-use residential, academic and performance venue". The centre's three public performance venues include the 590-seat Paramount Theatre, the 170-seat Bright Family Screening room and a 150-seat black box.

Other spaces include a film sound stage, rehearsal and media studios, practice rooms, classrooms, a scenery/props shop, 20 faculty offices and four dormitory floors housing up to 260 students.

## Creative redesign

The primary performance space in the Paramount Center – a former 1,500-seat movie house that opened in 1932 – is its renovated main theatre. Unlike vaudeville houses of the 1920s, this dedicated movie house had no stage. The addition of a full stage and the relocation of a proscenium well forward of the original screen required creative redesign to address sightlines and circulation.

Unlike the earlier restoration of the ornate Majestic, the Paramount renovation focused on adaptive reuse with the goal being to increase stage area and in doing so, downsizing the existing lower audience level to a capacity of 590 people. It was an exercise of re-imagining



The renovated Paramount Theatre can seat 590 people



space, taking cues from historic artefacts and creating details using architectural fragments and photographic resource materials. Thus, a sense of the history of Boston's theatre district was recreated in the newly reconfigured Paramount. Preservation focused on maintaining the integrity of the historic lobby and facade, which were the only elements still intact.

With the completion of the downtown campus and the inaugural season of ArtsEmerson under way, one might infer that Emerson's development is complete. Not so. The college, recognising the needs of students working in film production, has begun design of a new facility in downtown Los Angeles. If the City of Angels can reap a fraction of the benefits that Boston has in partnership with Emerson, this next move should be an exciting prospect. ■

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Photos: Peter Vanderwerker



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## DESIGN

H3 HARDY COLLABORATION ARCHITECTURE



The terrace at Lincoln Center Theater's LCT3

H3 Hardy Collaboration Architecture explains how responsible choices of finishes, fixtures and equipment in theatres can make a significant environmental impact

While sustainable design has permeated many types of arts facilities, the idea that a theatre building can be environmentally friendly seems at best counter-intuitive and at worst impossible. People naturally connect longevity and conservation to museums and libraries, while the art of performance is about the temporary: the event, the happening, the moment. Because theatres require flexible and intense lighting systems and climate control during performances, the perception is that in order to attain a level of sustainability, these technical requirements must be compromised. On the contrary, H3 Hardy Collaboration Architecture has helped many theatres implement facility solutions that demonstrate the compatibility between sustainable design and exceptional performance space.

While the main focus of theatre design must remain the performance space, the consideration of all elements of the building together can minimise the need for investments in costly acoustic and thermal isolation systems. The performance space itself needs isolation from exterior surroundings. Enveloping the performance space with dressing rooms, rehearsal spaces, wardrobe departments, scenery shops and

administrative offices provides a built-in acoustic and thermal cushion. This arrangement has an added benefit of bringing daylight and natural ventilation to areas that have been traditionally relegated to the basement. The design of LCT3 for the Lincoln Center Theater takes this approach, surrounding the new theatre with ancillary spaces that serve as an acoustic and environmental buffer.

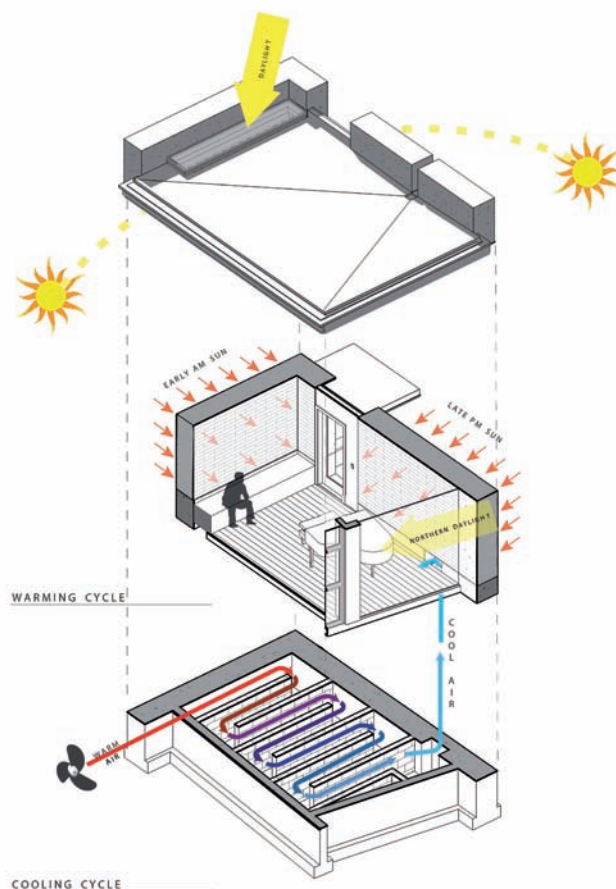
The traditional approach to theatre systems design has been to fill the entire theatre space with hot or cold air as needed – investing a large amount of the construction and operational budget into energy costs. A targeted approach can use less energy while leaving the audience experience unchanged. Instead of devoting a separate ventilation system to the lobby, which is only filled to capacity during small windows of time, some of the conditioned air from the performance space can be redirected to the lobby at peak times. During a performance, when the lobby is mostly empty, all units will direct conditioned air to the performance space.

For some theatre facilities, a natural ventilation system can also be a viable solution. For the Santa Fe Opera, open structures make the beautiful site surroundings part of the audience experience – and made systems costs a fraction of those for





a typical air-conditioned building. Taking further advantage of the site, private rehearsal buildings incorporate heavy thermal mass walls facing the sun and floor to ceiling windows on the less vulnerable sides to allow for natural ventilation and amazing views. Beneath the floor, a cooling labyrinth ventilates the building mass from below with the cool night air of the desert and refreshes the space in time for the next day. In an entirely different climate, H3 built the Glimmerglass Opera House in Cooperstown, New York, entirely without ventilation systems and features moveable walls that bring in the outside as part



An H3 Hardy designed vocal studio

of the theatrical experience.

Energy-efficient technologies such as LED lighting are becoming increasingly sophisticated and affordable. At both LCT3 and the new Signature Theatre, both in Manhattan, LED lighting has also been introduced for some back-of-house areas and for front-of-house.

These three approaches can help bring sustainability to theatres – not only to eliminate financial and environmental waste – but also to expand the horizons of the theatre experience. ■

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# In the groove

An impressive new dance centre has been created in an unused part of the listed Pavilion Theatre in Bournemouth

**The Pavilion Dance centre (below) has proved very popular since it opened in September 2010**

The Pavilion Dance centre at the Pavilion Theatre in Bournemouth, UK, opened its door for business in September 2010, with nearly 2,000 visitors and artists attending the opening weekend. Bournemouth Borough Council invested £3.3 million in the construction and fit-out of the centre, which will offer a wide range of dance activities. Dance South West will present a wide-ranging programme of dance from the South West region and beyond, and there will also be opportunities to see new dance created by established and emerging artists, performed both inside and out the venue. Pavilion Dance will offer dance classes, workshops and short courses suitable for all ages, and the centre will also be a base for regional, national and international conferences and festivals.



Drama by Design was the appointed theatre consultant and worked as part of the team developing the design, layout and finishes with the architect, and designing and specifying all the technical systems. Audio Light Systems in Edinburgh was appointed as specialist contractor, with Drama by Design as project manager.

“The idea was to create a regional dance centre for south-west England,” says Andrew Stone, the theatre consultant who worked on the project for Drama by Design. “It’s housed in a rear part of the Pavilion Theatre, an art deco theatre built in the 1920s. Design problems arose from the building’s listed status, which meant we were unable to fix or hang anything off the ceiling or walls. The solution was to use independent columns supporting custom-built aluminium trusses enclosing motorised lighting bars without any interference with the fabric of the building.”

One of the key criteria was to ensure the spaces could be used for a wide range of activities, ensuring that revenue streams could be maximised and the long-term running of the centre sustained. To this end, both studio spaces were equipped with professional quality sound systems, while the professional studio was also fitted with an induction loop-assisted listening system. The 180-seat performance auditorium incorporates technical systems for dance, theatre, conference and a full HD digital cinema system with surround sound. All systems can be operated via touchscreens around the auditorium, ensuring that the space can be set up in seconds for each different type of event. Once the portable lectern is in place, the presenter can control all aspects of the audiovisual presentation without the need for a separate technician.

Pavilion Dance centre was also fitted out with LED colour changing cyclorama lighting



and moving lights. These have many benefits over conventional luminaries, including better energy efficiency, lower heat radiation (resulting in lower building ventilation costs), better lamp life and built-in colour changing – so no need for costly and wasteful colour filters. The main auditorium also incorporates a system to monitor SPL levels to ensure compliance with the Noise at Work regulations.

The seating configuration was specially designed for the building and incorporates two fixed rows at the back of the auditorium, with eight rows of fully upholstered retractable seating in front. When the seating is retracted, the two back rows create a balcony with a handrail across the front, enabling people visiting the building for dance classes to sit at the back of the auditorium and watch rehearsals. ■

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How do you design an outdoor performance facility that meets all the requirements for summer performances, yet in the off-season continues to work in snow-covered surroundings?

Carol and Earl Holding, owners of the Sun Valley Resort, had a tradition of sponsoring the Sun Valley Summer Symphony on their beautiful campus every year, but wanted something more unique and reflective of their resort than the temporary shelters that were usually put up. In short, they wanted an outdoor atmosphere with a state-of-the-art facility.

They selected FTL Design Engineering Studio, which specialises in performance facilities throughout the USA. Since Sun Valley is a world-renowned ski resort with snowfalls exceeding 3m deep, the challenge for FTL was to create a structure that could survive the harsh winters and yet shelter audiences during the warm and sunny summers to retain a sense of the outdoors.

Taking cues from the land, the design developed as two curved walls of stone that come out of the land like forms of nature, then close together to form a place of music, before disappearing back into the land. Covering this breathtaking site, FTL developed a wooden chamber over the stage much like the inside of a violin. This was created by the construction of a steel cable net with a wood and copper skin, which was the first of its kind in North America. The steel cable net allowed the facility to bear the enormous snow loads in winter, while the fabric membrane enabled the creation of a luminous space to shade the audience, reflect sound and provide a sense of the outdoors.

Working with JaffeHolden on the acoustics and Auerbach Pollack Freidlander as theatre consultants, FTL developed a series of primary





trusses that carried the adjustable acoustic shell and lighting trusses, and which could accommodate the different acoustic and show requirements, from small classical chamber music to large pop music performances.

By creating seating in the form of a bowl, the 1,500 seats inside the 'house' became an intimate space both for the performers on stage and for the audience. On the sides, the terraces with flexible seating enhance the sense of enclosure by creating a play between the indoors and an outdoor room. At the front of the lawn along the edge of this bowl is a wide promenade much like at Tanglewood; beyond this is the sloped lawn for an additional 3,000 spectators, with a distributed sound system to provide an enhanced sound throughout. Tucked under the terraces and behind the stage are 1,850m<sup>2</sup> of backstage

facilities, including restrooms, dressing rooms, offices and support facilities.

Working with local firm RLB Architectura and its consultants, the project was constructed in only 11 months, which is about half the normal time for a project of this complexity. Even with this breakneck speed of construction, a world-class facility emerged on time to usher in Kevin Puts' *Hymn to the Sun*, commissioned for the event by the Sun Valley Summer Symphony.

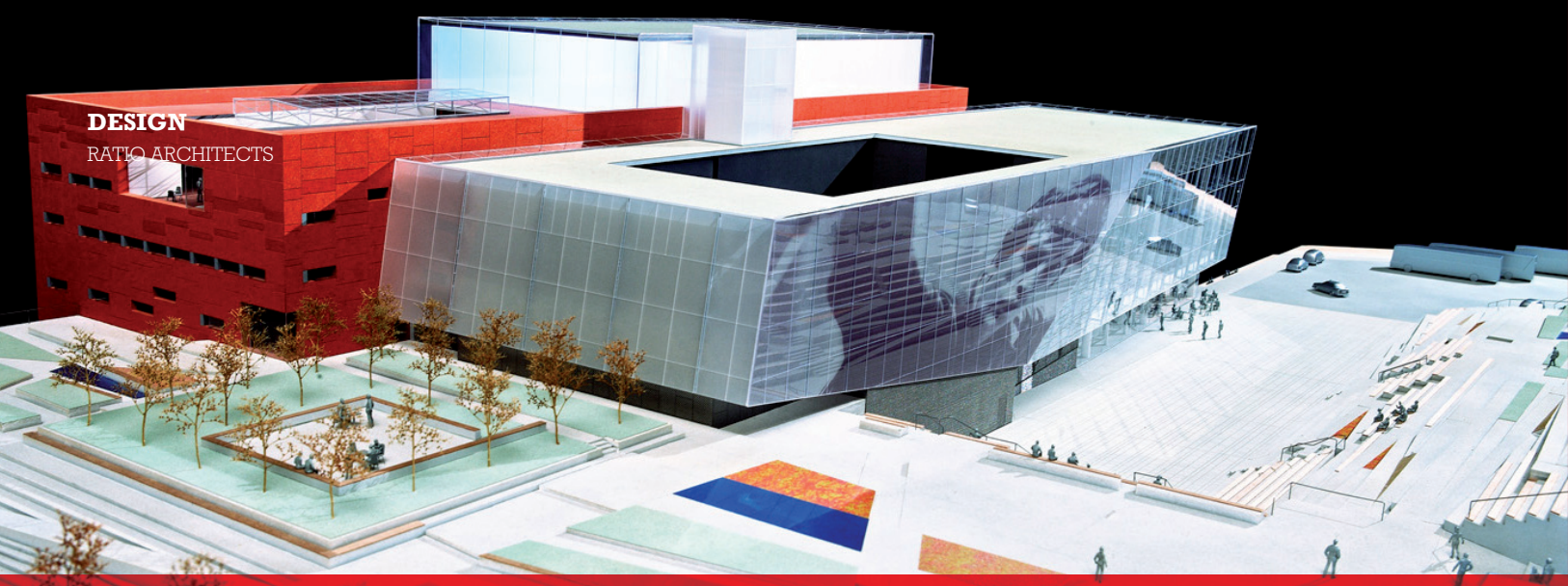
Goethe once wrote that architecture is frozen music; this statement represents the exploration of the art and science of architecture and music and is an apt description of this pavilion, which mimics the tensile qualities of string instruments with the structural form of a cable net. ■

[www.ftlstudio.com](http://www.ftlstudio.com)

**The Sun Valley Pavilion is designed to host summer events from May to September – and to withstand the harsh Idaho winter!**



DESIGN  
RATIO ARCHITECTS



# Double act

The relationship between people and buildings is central to the work of Norwegian architect Ratio

**R**atio Architects, an architectural practice in Oslo, Norway, has a portfolio consisting of all types of buildings, but the main focus is on public work, mainly cultural and health facilities. At the heart of the design concept for such buildings is the relationship between the buildings and the people who will use them. Currently, the company is working on a new concert hall in the city of Stavanger, in the southwest corner of Norway.

In 2003, Stavanger invited bids for the design of a new concert hall on a harbour-front site, five minutes from the historic city centre. The programme consisted of two complementary halls with roughly the same footprint but fundamentally different in concept and function. One was to be a 1,400-seat shoebox-acoustic hall with a large organ for the city's 75-member symphonic orchestra and other non-amplified music. The second was to be a multipurpose hall for 'everything else' including: electronically amplified music, musical theatre productions, dance shows, rock and jazz concerts, experimental events and conferences. Theatre-style seating capacity was planned to be 800 and, with a flat floor, up to 1,900.

Ratio's proposal won, with a concept that explored the polarity of the two halls, positioning the orchestra hall like an instrument in an empty space, in a solid box and the multipurpose hall as a rough metal box in an open-glass space. The public areas are situated in the glass area facing the harbour and entrance plaza. Back-of-house functions are placed in the solid concrete box. This simple and easily understandable

division has proved very successful throughout the development of the project in collaboration with the client, users, technical consultants and acousticians.

The orchestra hall will be the main space of the building. In partnership with acoustician Eckhard Kahle, the architects have designed a hall with a relatively small parterre and three gallery levels. Apart from catering for larger symphonic pieces, it has also been crucial to offer top-quality sound for soloists and smaller groups. There is a 900m<sup>2</sup> ceiling that can be moved 5.5m vertically to achieve a 28% reduction in hall volume. For architectural intimacy and acoustic clarity, the two upper-side galleries are 2m away from the sidewalls of the hall. The gap doubles as an artificial skylight on the sidewalls that can be used as part of the performances. Lighting successively the outer, middle and inner surfaces gives rich opportunities for tuning the mood of the hall. The walls are clad with oiled and varnished, 'string-instrument' coloured maple panels in a non-repetitive pattern for diffusion. Balcony fronts are double curved and tilted for reflections to all parts of the audience. The canopy function above the stage is solved by a group of ellipsoid 3D reflectors made of semi-transparent fibreglass and lit from the inside. This will close the space architecturally and soften the appearance of technical equipment suspended from the ceiling.

The multipurpose hall will span intimate club atmosphere, through experimental theatre, to conference hall. It connects to the main foyer through a 4 x 8m opening. Together with the foyer it can accommodate large banquets. The



**Model view from south west-entrance plaza and amphitheatre (top); model view from east showing proximity to waterfront (above)**





Rendering of orchestra hall (above); model view of orchestra hall (below)

colour is a deep bluish black, and the balcony fronts are enhanced with lit metal mesh to create a visible clear space. The floor consists of flexible platforms that can carry telescope tribunes. The front platforms can be lowered for orchestra pit and the back scene, and can be raised as a stage at rock concerts with a flat-floor layout. For more festive occasions, candelabras can be mounted and brought into the room to create a central focus, again different from the neutral, flexible space.

In the foyer there will be several spaces for informal concerts and performances. Outside, around the outside entrance plaza, is an amphitheatre with more than 2,500 seats. ■

[www.ratioark.no](http://www.ratioark.no)



RATIO arkitekter AS is a merger of BGO Arkitekter AS and Medplan AS Arkitekter established in 1984 | 1991. The offices have collaborated over many years on shared projects, especially in the cultural building sector, and have together and independently made an impact in many architectural competitions. The office has wide experience including larger hospital projects, cultural research and educational establishments both in Norway and abroad.

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'RATIO' symbolises the focus of our practice; the relationship between people, buildings and the environment. Architecture is the creation of spaces for people – the physical surroundings for our lives, activities and interactions.



# Money matters

Venue, an arts cost consulting firm, explains the mechanics of the costs involved in building performance facilities



**Scaffolding, John F Kennedy  
Center renovation**

Quinn Evans Architects

**W**hy are performance facilities so expensive? This is one of the most common questions specialist arts cost consultants are asked.

Needless to say, there is no simple answer. Aside from the obvious cost drivers of location and site constraints, every performance facility is subject to its very own unique parameters of size, quality and budget. Add to this the inherent complexity of design and construction, and you begin to see why there is no standard per-seat or per-square-foot cost. To understand the cost-drivers of a performance facility, you have to understand what makes it work and how it functions.

It might seem like size is a simple issue, however determining the size or programme (sometimes also referred to as a brief) requires a deep understanding of how a performance facility functions and operates. Typically, at the start of the design process, a theatre planner provides a detailed list of the building's room-by-room spaces on a net square foot (or square metre) basis, measured inside wall to wall. Part of Venue's expertise, as a cost consultant specialising in performing arts, visual arts, educational arts and entertainment arts, is to work out what needs to be added to this net programme to arrive at a gross floor area programme for the building, upon which initial cost and design is often based.

Typically, allowances for circulation, mechanical and electrical spaces, unusable or inaccessible spaces and allowances for structure and wall thickness need to be added. And this is where the challenge begins. Circulation requirements vary greatly based on the type, functionality and location of each of the programme's rooms. Mechanical and electrical space to house head-end equipment varies depending on the size of the net programme and

the need for equipment to be housed inside or outside the building, or a combination of both. This is often due to acoustic standards and/or whether there is a central utility plant system to tap into. Unusable or inaccessible spaces are an inevitable part of these complex buildings as their design is often irregular and the size and complexity of the facility will also have an effect. As the net area of each room in the programme is measured from inside wall to wall, allowances must be added for the wall thickness, structure and other factors to determine the gross floor area of the building. The net-to-gross floor area factor can vary by up to 20%, hence an expensive item if you are on the high end of the net to gross scale. It's also important to note that the net to gross floor area for a performance facility is probably on average about 30% more than a typical commercial or residential building.

## Quality control

Architects' designs vary greatly with resulting ranges in cost. Interior and exterior finishes can obviously vary from bare bones to lavish, with corresponding cost implications. Don't let the level of finishes fool you, however. The exterior enclosure and interior finishes account for only an average of 30% of the building cost, meaning that no matter how you value-engineer the exterior enclosure and interior finishes, 70% of the cost of these complex buildings still remains in the structure, mechanical/electrical, speciality equipment and site.

Acoustic requirements are driven by the desired sound rating of the performance spaces and by external interference that needs to be mitigated. While often not visible, acoustics can be a major hidden driver of cost. Acoustics help shape the main performance spaces, define the volume, height and width of the hall,



## CONSULTING

involve sound adjacencies and isolation, help define the location and specification of mechanical equipment, size of mechanical ducts and electrical isolation issues. Theatrical requirements are driven by the functionality of the performance spaces, layout and sightlines, and speciality performance equipment and its accommodation. Sustainability and material life-cycle analysis that quantifies energy and material usage is also an important quality consideration, not just for the short-term capital cost of the building, but for the long-term operating cost.

So it is expensive, but when you understand what goes into these buildings, it all makes sense. That is why it's important to know from the outset what your venue is going to cost and how decisions made during design and construction will impact the bottom line. ■

[www.venue-consulting.com](http://www.venue-consulting.com)



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# Grand design

Stephen Hing, project manager and director at Drivers Jonas Deloitte, explains how the RSC pulled off an amazing feat

**Drivers Jonas Deloitte project managed each of the phases of the RSC's Transformation programme, and was town planning advisor for the Royal Shakespeare Theatre (right)**

**H**ave you ever watched *Grand Designs* and marvelled at those people who continue to pursue their careers and raise a family, all the while developing their project for a new dream home? Well, the Royal Shakespeare Company (RSC) has just completed its own grand design on a gargantuan scale – all the while playing to packed houses at the temporary Courtyard Theatre, in London and on tour. There has been no let-up either, reaching out to new audiences through schools and community events. The RSC has also become a real estate developer, in the thick of a £112 million transformation programme.

It began with the conversion of The Other Place into the RIBA award-winning 1,000 seat Courtyard Theatre by Iain Ritchie, a temporary theatre that opened in 2006. The RSC has developed its own hub in Stratford-upon-Avon, extending the site of the Union Club offices in Chapel Lane to house different teams in open-plan spaces and then converting an industrial building on the edge of the town into temporary rehearsal studios, winning a local design award in the process. Then the Royal Shakespeare Theatre (RST) itself; a transformation of the 1932 Elizabeth Scott building by Rab Bennetts, into a 1,000-seat thrust stage auditorium with an internal colonnade to link with the Swan theatre, stage engineering to make the dreams and visions of the artistic director a reality, new back-of-house facilities and a much larger foyer area. The RST is now a visitor attraction with a centrepiece viewing tower over 30m high, new bars, café, rooftop level restaurant, an outside theatre square and new public realm to reconnect the river walk along the Avon between the Bancroft Gardens and the Holy Trinity church. And this was all completed to programme and within the budgets for every phase of building works – a staggering accomplishment.

So how has this been possible for a theatre company to achieve, when professional firms

whose core business this represents can sometimes struggle? At the heart of the RSC Board has been amazing vision, resolve and clarity of purpose. It recognised early on that there would be technical complexities, risks from discoveries during the building works and then there is the nature of the RSC itself. Complex, exacting, concerned about the minutest details, sometimes chaotic – like any theatre company.

Recognising that here were all of the ingredients for a disaster, it was decided that the best way of dealing with all these risks and issues was not to partner up with a developer or a contractor and transfer these risks, but to get the necessary skills itself and be in control of all the issues. This brave logic was compelling. Why pay somebody else to manage problems and then hand over a bill every time something changed? Why not create your own expertise and deal with problems to suit your own priorities.

## Experienced team

The RSC brought in an experienced project director in Peter Wilson (from Tate) and established a very capable team of designers, engineers, project managers and cost managers. It then effectively became the main builder itself by individually contracting with each of the many construction trades under the organisation of a construction manager.

By rights there should have been problems that got the better of the project. The Avon burst its banks and the town was flooded in July 2007 just two months after work had begun at the RST. A fire destroyed the production premises of the stage engineering contractor, there was the discovery of a cemetery, underground streams filled the excavation of the new basement, building occurred at the height of the boom and continued throughout the worst recession in a lifetime. But when the problems came, they just got dealt with. There wasn't really any fuss. It was just another day.



You read about having teams who are like-minded, driven by the same purpose, who deal with problems by rolling up sleeves and coming together. That really was achieved here. The infectious enthusiasm of the RSC, the characters within the teams, the magic of the RST and of Stratford had a part to play. Being located together meant that tradespeople sat alongside the architect and engineers as equal design partners and all the while the original programming and budgeting remained spot on. The support of the people of Stratford also played a part. Hardened constructors were almost moved to tears by the applause of the gathered crowd as the first of the huge roof trusses was lowered into position.

Stratford now has its theatre. Kevin McCloud would surely approve. ■

[www.djdeloitte.co.uk](http://www.djdeloitte.co.uk)



## Another outstanding performance.

**Drivers Jonas Deloitte is proud to project manage the Royal Shakespeare Company's Transformation.**

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# Sound advice

The new Guangzhou Opera House in China has already received acclaim for its superb acoustics

**Sensual convex and concave forms characterise the interior design of the Guangzhou Opera House in China**

The newly opened Guangzhou Opera House, located on the bank of the Pearl River in the southern Chinese city of Guangzhou, is a masterpiece created by the joint talents of Zaha Hadid's design expertise and Marshall Day Acoustics' innovative approach to room acoustics. Zaha Hadid won the design competition in 2003 and shortly after Marshall Day Acoustics was selected as acoustician – all after a rigorous tender process.

Zaha Hadid is a London architect, renowned for her avantgarde design approach for 21st century buildings. Marshall Day Acoustics is a multinational acoustic consulting company that specialises in a collaborative approach to the acoustic design of performing arts centres and concert halls. The interior of the Guangzhou Opera House has very sensual convex and concave forms, which is the signature of a Zaha Hadid building.

Peter Exton of Marshall Day Acoustics says: "Acoustically, the project was extremely

challenging to model and the 3D Odeon model required over 6,000 surfaces to accurately simulate all the curved surfaces. A 1.25 physical scale model was also needed to fully investigate the room's behaviour."

The completed 1,800 seat Guangzhou Opera House, built over five years and at a cost of £92 million, is one of the three biggest theatres in China. It is now a core part of the city's cultural centre and is one of the city's key attractions. The opera house opened in May 2010 to great acclaim with a performance of Puccini's Turandot. This opera is a favourite in China and the stage production was under the expertise of the director, Chen Kaige, who made full use of the aesthetics and asymmetrical interior of the opera house to great effect. Lorin Maazel's conducting of the chorus and orchestra of the Shanghai Opera displayed the superb acoustics of the hall.

The acoustics of the opera house received splendid reviews from performer Richard

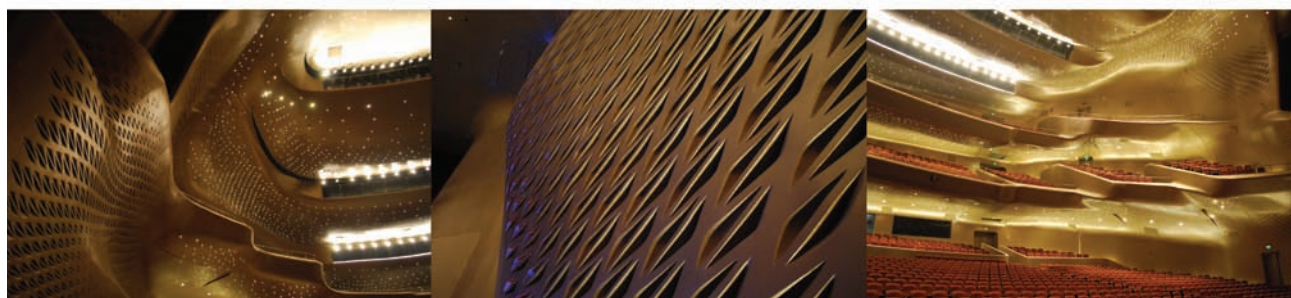




Margison (Canadian tenor) in an interview with Opera Now after the first night's performance at Guangzhou Opera House: "The auditorium itself is pretty big inside, but still has an intimate feeling. The acoustics are fantastic – not too dry and not too bright. We kept the opening night performance going continuously, but at the end of the opera the response was extremely tumultuous and we received a standing ovation. All in all, it's been a huge honour for me to be part of the birth of a new opera house and a new audience. It's a wonderful venue and I'd certainly like to come back here to perform again in the future."

In addition to the room acoustics, Marshall Day Acoustics was also involved in the assessment of vibration transfer from the adjacent underground railway line and the control of building services noise. ■

[marshallday.com](http://marshallday.com)



#### GUANGZHOU OPERA HOUSE Opened May 2010

Marshall Day Acoustics collaborated with London-based architect Zaha Hadid on the acoustic design for the Guangzhou Opera House

*"The auditorium itself is pretty big inside, but still has an intimate feeling. I must also say that the acoustic is fantastic - not too dry and not too bright..."*

Canadian tenor, Richard Margison, in an interview with Opera Now after the First night's performance of Turandot at Guangzhou Opera House

Marshall Day Acoustics opened a UK office in London in June 2010

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# Online — not in line

Increasingly the venue is the place to perform  
and the web is the place to book tickets

**W**hen the iPhone 4 was announced in June 2010, thousands queued up in virtual lines to pre-order the new device from selected online providers. Yes, there were still lines of enthusiastic fans waiting outside Apple stores on 24 June, but those lines would have overwhelmed traditional over-the-counter channels if online ordering and virtual 'queuing' had not been in play. The ticketing industry is familiar with this phenomenon – the web has permanently altered ticket sales methodologies, eclipsed traditional in-person ticket delivery and one could argue it has even morphed the very concept of the ticket itself. Now more than ever, the ticketing industry is taking advantage of web-enabled technology and devices to extend customer service and customer convenience into the hands of the consumer. Online has overtaken offline and the role of the venue is evolving.

Innovation is everywhere. Front of house, venues are placing greater than ever emphasis on service, creative packaging, pinpointed marketing and enhanced food and beverage experiences. In the back office, we've seen a swing away from hand-your-fee-revenue-over-to-the-big-ticketing-service-provider model and towards ticketing systems that allow the venue to retain control and revenue in-house and keep service to their standards. Couple these changes with the impact of the web and the result is an unprecedented opportunity for revenue growth and greater customer satisfaction.

For example, the average venue served by Tessitura Software is now bringing in over 50% of its revenue online with many performances selling out at 70% online rates or higher. Sarah Woods, director of customer relations at the

## The Birmingham Hippodrome



Royal Albert Hall, says: "The recent record sales of the BBC Proms via the Royal Albert Hall website recorded sales of over 80,000 tickets in one day with 65,000 sold online. All 75 concerts went on sale via web, phone and in person at the same time and this was a major change with great results from the methodology used for the last 15 years."

Venues are realigning box office staffing and with the print-at-home capabilities that Tessitura and other systems provide, the buying experience is as easy as booking an airline ticket on a printer or mobile device. Thus, the ticket evolves away from being a physical piece of paper and becomes something a bit more esoteric... a time-specific unique identifier associated with that customer with several means of fulfilment. And the result of all this? Decreased staffing costs, avoidance of shipping fees and shorter queues mean there is more time for consumers to enjoy the event.

Capabilities like online select-your-own-seat mean the customer can be in control of the process and no longer are they worried whether they got the best seat available from the ticket agent at the time of booking. The results can mean strong sales even in tough financial periods. At the height of the financial downturn in 2008, Stuart Griffiths, chief executive of Birmingham Hippodrome, said: "We have been quite taken aback by the popularity of the new season, and our new box office system (Tessitura) was really put through its paces. At one point, nearly 75% of our tickets were being purchased online. In this industry, you learn never to be complacent, but despite the calamities in the financial markets, thousands of people are making sure they still have a few treats in store over the next 12 months. They won't be disappointed."

The theme here is that the best pre-performance customer service may ultimately be





**The Royal Albert Hall**

self-service, putting the control into the hands of the consumers to pick their products from a richly presented product catalogue, picking their seats in real-time and getting immediate ticket delivery on whichever device is most convenient. And the web is what drives this capability.

Jack Rubin, president of Tessitura Network, says: "The future will see this online trend and shifting roles accelerate further. Flexible, service-

based systems, such as Tessitura Software, allow venues to use CRM data for even more powerful and accurate customer interaction, predictive customer modelling and nimbly produced promotions that can be created quickly by venue operators and promoters and sent out via email, mobile and social networks and other channels to promote performances and push sales when needed. Smart database systems can quickly find the most likely prospects for specific events. Early buying periods promoted privately for members and subscribers enhance the benefits of memberships and can boost early bookings and use special allocations of seats."

The venues, and live performance experience that the consumers see in person bring lasting memories, but the role of the venue will continue to evolve as consumers spend more and more time online and less time standing in queues. ■

[www.tessituranetwork.com](http://www.tessituranetwork.com)

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# The main event

Artifax's venue management software has provided an ideal solution for coordinating the Sala São Paulo's busy schedule



**Interior view of the Sala São Paulo; exterior shot below**

The Sala São Paulo, home to the Orquestra Sinfônica do Estado de São Paulo (OSESF), celebrated 11 years as a world-class concert hall in 2010. Since its renovation and transformation, completed in 1999, it has played host to the likes of the Vienna Philharmonic and Elton John.

The most obvious and striking image associated with Sala São Paulo is the stunning ivory, column-lined, 1,400 seat concert hall with its impressive adjustable ceiling – 15 metal panels that are moved to achieve perfect acoustics before each performance. However, there is so

much more to this majestic building. Look a little closer and it emerges as a trove of flexible spaces available for not only music events, but lectures, meetings, conferences and private parties.

Such a venue will naturally have a high demand for use of its spaces, meaning a packed event schedule involving potential resource, staffing, hospitality and reporting headaches. Sala São Paulo needed a way to coordinate all of these facets of venue management. This prompted Sala São Paulo to get in touch with Artifax Software, supplier and developer of *Artifax Event*, a venue and event management software used by concert halls, performing arts venues, museums and festivals the world over. *Artifax Event* combines detailed calendar scheduling with a flexible and highly configurable database in an easy-to-use system, which can manage how every corner of a venue is being used every second of the day.

OSESF had been managing up to seven event spaces, dressing rooms and catering facilities, as well as arrangements relating to visiting artists, using spreadsheets. Research undertaken by Artifax Software has revealed that even a modest venue can save up to 1,770 hours annually (representing about £16,000 per annum) by using a comprehensive event management software package such as *Artifax Event* as opposed to a system of spreadsheets and basic calendars. Venue managers such as Eneida Monaco at OSESF realise that there is no need to be copying and pasting information and having staff running around with messages written on scraps of paper when there is a solution waiting for them.

Now, when OSESF books a performance into the Sala de Concertos, or a business event into



Stefan Schmelting

Tuca Vieira



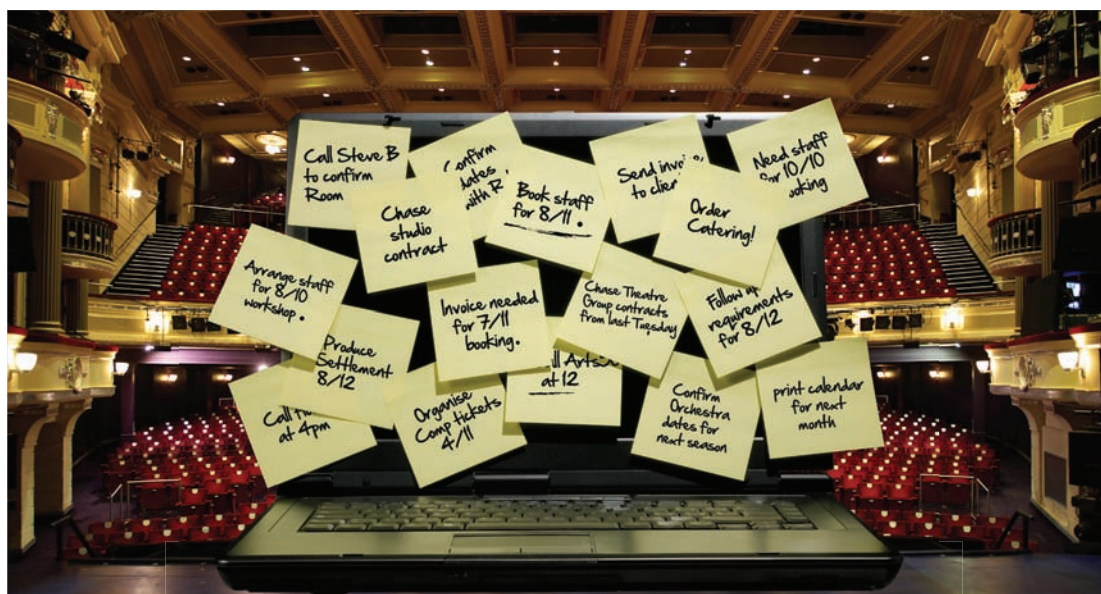
the Salao Nobre, all details go straight into the database, which logs space being used, dietary requirements, staff scheduling (even allowing staff to enter their own availability) and artist accommodation and travel arrangements. Contracts, letters and invoices are easily generated, printed and saved in the right place so that they can be found quickly next time they are needed.

But it doesn't end there. As staff at Sala São Paulo were trained in using *Artifax Event*, the software opened up more possibilities to them. They soon realised that while it can be used to coordinate spaces and keep staff informed with up-to-the-minute information, *Artifax Event* can also be used to manage OSESP's itinerary while on tour, widening the scope of *Artifax Event* further than Sala São Paulo itself. ■

[www.artifax.net](http://www.artifax.net)



Ana Fuocci



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# Illuminating subject

Gerriets' extensive range of projection screens can meet the needs of theatres of all shapes and sizes

Founded in Freiburg in 1946, Gerriets has been known for more than 60 years as a supplier not only of flame-retardant textiles, art curtains and fully automatic curtain track systems, but also projection screens – mainly for the theatre and event sector. With its long history and comprehensive product portfolio, Gerriets is one of the oldest and most versatile screen suppliers worldwide. Today the company manufactures more than 20 different front, rear, and front-and-rear projection screens. Every year Gerriets produces some 100,000m<sup>2</sup> of projection screens, using state-of-the-art, high-frequency welding technology to guarantee razor-thin, nearly invisible seams – as well as consistent quality.

The company's signature OPERA line was born more than 40 years ago, when Gerriets created a huge projection cyclorama for the Paris Opera. Throughout the industry, the term 'opera screen' is still synonymous with large-scale stage projection. In recent years, rapid technological development in the projection field along with increasingly widespread use of projection screens in live performance, events, exhibitions and architecture has led to greater demand for a wider range of screen materials. General-use front-projection screens continue to be

bestsellers, and examples include OPERA white, creamy white, and grey blue, which provide good reflection and transmission, and OPERA white perforated/micro-perforated, which is acoustically transparent. But more and more, screens are specified for a wide array of special applications.

Gerriets has continually expanded its range of screen offerings to meet this demand. Rear-projection screens include: OPTITRANS and OPTILUX for excellent picture quality; PANORAMA for seamless cycloramas up to 3m wide; and TRANSMISSION with superior diffusion properties, best for edge-blending projections and diffusion of LED-animation-style backdrops.

Gerriets also manufactures dual purpose front-and-rear projection screens. HIGH-GAIN offers a gain of 1.8 and certain 3-D projection uses in-front projections, and also has rear projection possibilities. SHOW is best qualified for passive 3-D rear projection and special effects. A brand-new addition is EVEN, a pure white projection screen that features an absolutely even luminance distribution and offers the same gain factor in front and rear projection.

The technology has become so sophisticated, and the products so diverse, that today's customers need extensive specialised knowledge





**A 100 x 20m, projection screen in Seoul, Korea**



**OPERA projection screen, Sprinter Presentation, Barcelona**

to find the right specification and make the correct purchasing decisions. Gerriets therefore makes its in-depth expertise available not only via direct consultation with its seasoned technical professionals, but also by reaching out to broader audiences. The company presents workshops to provide practical guidance on various screen applications and produces a steady stream of press releases and newsletters to keep architects and decision makers informed about developments in the field and Gerriets projects of particular interest.

### Screen systems

Aside from projection screens available ready made in stock sizes and custom-made to order, Gerriets also offers a wide range of screen systems. Portable frame systems – designed to be easily installed, dismantled and transported –

provide the utmost in mobility for touring purposes. Roller screen systems range from very small, to as wide as 13m. Other systems are designed specifically for the architectural market.

And Gerriets is the only supplier of carbon tube roller screen systems as wide as 24m. The reinforced carbon tubes feature high material strength and low deflection under load, enabling large screen sizes and fast roller speeds. The TUBE system (up to 12m wide) and MEGASCREEN TOUR system (up to 24m wide) are designed for portability and easy assembly in limited spaces. In the MEGASCREEN TOUR and MEGASCREEN (for permanent installations) the carbon tube rolls up and down with the screen surface, whereas the smaller TUBE is a top-rolling system. ■

[www.gerriets.com](http://www.gerriets.com)



OPERA® grey blue | 71,00 m x 7,96 m | Bayer AG General Meeting 2010 | Photo: Bayer AG

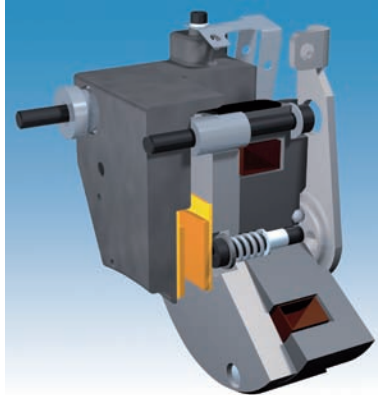
## Gerriets: The world of screens

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**The ROBA-diskstop brake works with a relatively large air gap and is equipped with a sound damping system**

# Safety in a six-pack

Six single brakes supplied by mayr power transmission ensure safe use of a stage winch

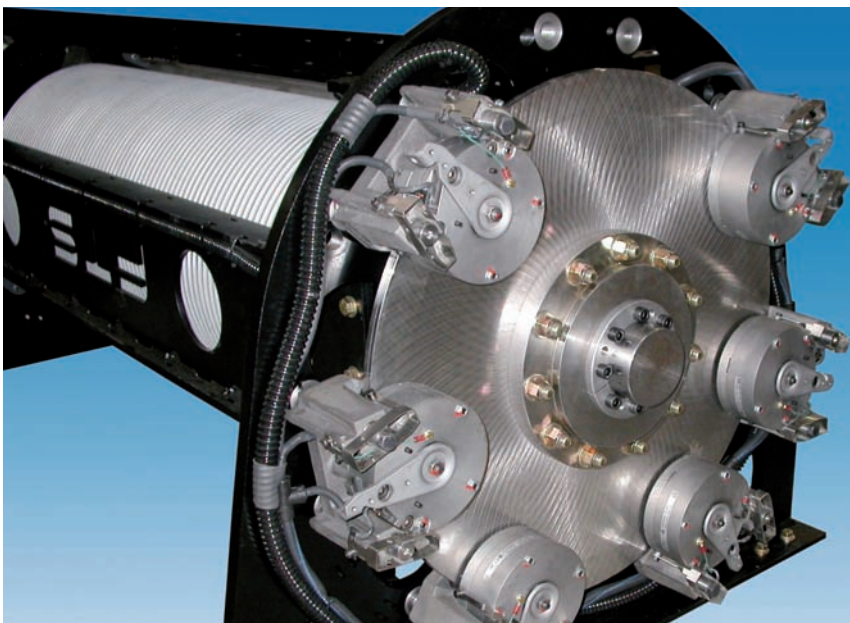
In action scenes in the blockbuster movie Spiderman, the comic-book hero is often seen flying through New York's streets. In these scenes 'flying machines' are used, with stage winches propelling stunt men through the air on thin wire ropes. Such stage winches are also used in theatres, concert halls or concert stages to move, lift and

lower scenery, curtains or heavy spotlights. In order to protect the actors, winches specially designed for stage applications are equipped with redundant safety brakes, such as those manufactured by mayr power transmission.

Mayr, based in Mauerstetten, Germany, makes innovative braking systems for all modern-day stage applications and also offers an extensive range of safety brakes, based on the firm's decades of experience in development, manufacture and application.

One American manufacturer used six of mayr's single ROBA-diskstop caliper brakes on the brake disk of a stage winch. This seemingly high number of brakes is required to achieve the required braking torque, although this type of arrangement of several brakes also has an interesting and positive side-effect. As is the case on systems with two brake circuits, one brake also has the job of compensating for the failure of another brake, meaning that one additional brake is needed to fulfil this task. The other five brakes produce the required braking torque, meaning that each of these produces only 20%. If all six brakes are intact, the system delays an emergency braking action by 120% of the nominal braking torque and the braking torque increase is not 100% as it is on systems with two brake circuits, but just 20%. Thus braking is far more gentle and poses less of a strain on peripheral components.

The ROBA-diskstop is left in a de-energised condition, ready for emergencies or power



**Five ROBA-diskstop safety brakes produce the required braking torque on a stage winch – a sixth redundant brake ensures the safety of the device – the torque increase during emergency braking is only 20%**

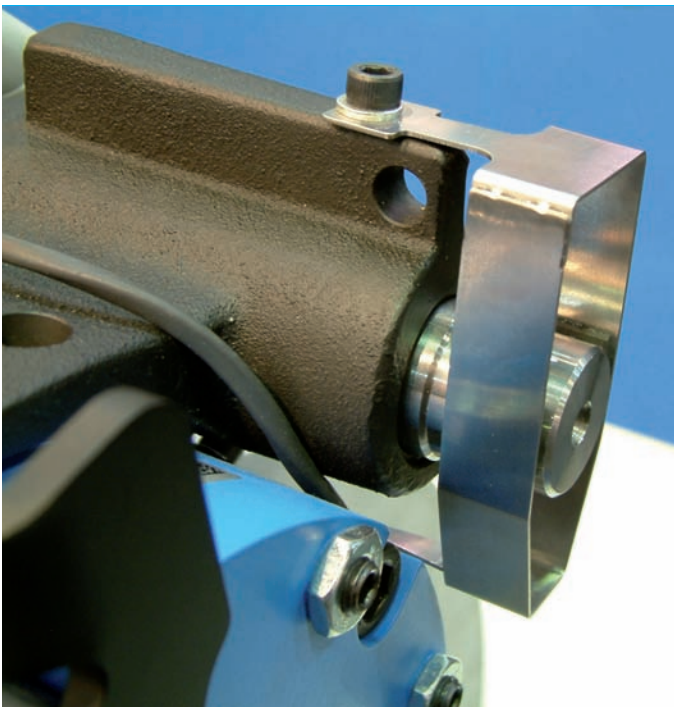


failure. When the magnetic coil is energised, an armature disk is pulled against the screw springs towards the coil carrier and the brake is released. A microswitch monitors the release, preventing the drive starting up before the brake is opened. The integrated hand release allows the de-energised brake to be opened manually for checks or maintenance work.

These floating bearing-mounted caliper brakes are state-of-the-art technology today, and are highly popular for use with stage technology due to their robustness and reliability. However, it has emerged in practice that slight contact of the friction linings on the rotating brake disk can produce noise, due to the floating bearing on the brakes and the magnetic effect, caused by the energised coil as the brake follows the movement of the brake disk. This results in mild permanent grinding, which would not be acceptable for the majority of stage productions.

For this reason, the ROBA-diskstop safety brakes have been equipped with an alignment mechanism for the stage winches to ensure that an even air gap is present both on the left and right side of the brake disk when the brake is open. Even if the friction linings wear unevenly, this design ensures that the brake disk can turn between the two friction linings without grinding when the brake is open due to the even air gap. ■

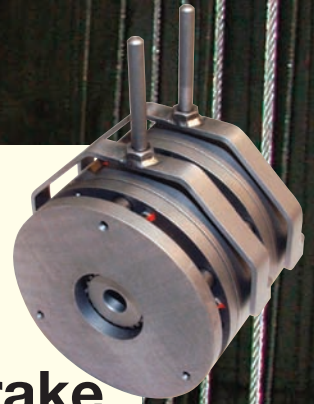
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**The alignment mechanism ensures an even air gap is produced on both sides of the brake disk when the brake is released**

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# Flying high

Flying-effects supplier ZFX Europe has combined science and art to great effect

**ZFX came up with the design for flying mannequins for a retail store in Shanghai**

Artists and engineers are two completely different breeds. Neither uses a common language and the lingo is mutually unintelligible. It takes an understanding of both the technical side and the artistic side to accomplish truly spectacular flying effects. With one foot firmly planted in each world, ZFX Europe speaks both languages so the transmission of art and science never gets lost in translation.

More than a decade ago, Frontline Rigging in Utrecht, Netherlands, also became ZFX Europe. While others may offer performer flying on their list of services, ZFX is one of the only dedicated flying-effects suppliers, capable of providing the complete package – artistically, logistically and technically.

When you don't use a dedicated flying-effects company, you realise that the gear was the easy part as soon as the performer gets on the wire for the first time. Suddenly, all kinds of questions arise. Why isn't the performer holding themselves up correctly? How do they unhook in front of the audience? What is the operator supposed to do if the performer lands wrong? How come the harness shows through the costume? Do we really need more than 30 minutes flying rehearsal?

Technically speaking, the gear provided by other companies can fly performers, but the gear alone can't turn the director's vision into a reality. ZFX is the link between the director, performers, operators, costumers and technicians. Because performer flying is its speciality, the company has an advantage when providing automation-based effects that don't actually fly people. While mannequins are not technically performers, the UNIQLO flagship retail store in Shanghai, China wanted them to be. The architects at BJC had a visionary idea about flying mannequins within a six-story atrium and contacted ZFX for the technical details. Thinking ZFX only flew people, BJC had scheduled a separate meeting with a design firm to handle the finer points of the artistic vision. But having realized that ZFX was equally fluent in both art and science, BJC confidently recommended ZFX as the provider for the entire flying atrium project. This led





to a seamless installation process, eliminating possible miscommunication between conceptual design and fabrication teams.

During the 2010 Winter Olympics in Vancouver, ZFX was awarded the contract for all flag-raising medal ceremonies. It is imperative that the flags fly every time without fail and the main advantage of using a 'flying' company is that the same procedures and safety systems are used no matter what is being flown. This ensures that a performer is not stuck in the air due to the power failure. These same systems and procedures are easily adapted to flag-raising hoists.

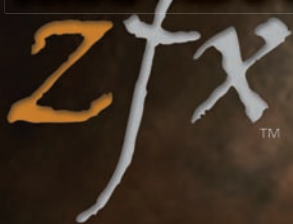
Incorporating flying effects into a production goes far beyond just technical issues, but ZFX Europe has proved that is possible to combine art and science with great success. ■

[www.frontline-rigging.nl](http://www.frontline-rigging.nl)



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# Variety show

Flexible staging and seating accommodates a variety of performances at the Wyly Theatre and the Winspear Opera House



**The Wyly Building (above) and the Winspear Opera House**

As economic conditions increasingly require us to do more with less, our cultural centres and entertainment venues are also trying to meet these same demands. Many of these facilities are now referred to as 'multipurpose venues' and are built or renovated to accommodate a vast array of performances and other forms of entertainment – from sports, to live theatre, to concerts, opera and dance.

With these multipurpose facilities comes the problem of accommodating each type of production so it can meet its full potential, and the ability to quickly and easily reconfigure the venue is key to this. This is the case at the venues

comprising the new AT&T Performing Arts Center in Dallas, Texas. Quick, flexible stage and seating configurations were incorporated in the design to accommodate a variety of performance types at the Margot and Bill Winspear Opera House and the Dee and Charles Wyly Theatre. The distinct all-glass vertically stacked configuration of the Wyly breaks from traditional theatre design – with support structures positioned above and below the building. Stage engineering specialist Serapid's LinkLift columns were used to allow for quick changes to the configuration of the performance spaces at the push of a button.

The 575-seat Potter Rose Performance Hall inside the Wyly includes 46 LinkLift columns to power the proscenium lift, a seating wagon lift, six seat configuration lifts, six turntables, and 12 seating riser lifts. One of the proscenium lifts is 20m<sup>2</sup> and travels nearly 11m. In addition to the lift columns, two push/pull systems for the 'superfly' towers service the stage level, and enable seating or scenery to be lifted or lowered from storage facilities. The 'superfly' towers are the key component to the rapid reconfiguration of performance areas. These allow artistic directors to fulfil their visions using six stage configurations that can be set up in less than a day: proscenium, thrust, flat floor, traverse, arena and studio.

The Winspear Opera House gives a 21st century edge to the traditional horseshoe. It is specifically engineered with flexible acoustics, and stage and orchestra pit arrangements for opera, musical theatre, ballet and other dance forms.





It normally seats 2,200, but its flexible seating setup means it can accommodate audiences up to 2,300. Serapid provided 12 lift columns for the two prosceniums and one sound cockpit lift.

The flexibility of the stage arrangements at these two venues, as well as at other venues across the world, attracts a variety of performances. The lift systems can help extend the stage, which will make the venues attractive for Broadway productions. Additionally, lifts can be used to increase seating capacity, as was the case at the Winspear.

The AT&T Performing Arts Center has already accommodated a number of travelling shows and Broadway productions since opening in October 2009 – including recent productions of Avenue Q, Beauty and the Beast and other live concerts. ■



[www.serapid.com](http://www.serapid.com)

The lift platform at the Wyly Theatre (left) and Serapid's LinkLift columns (right)



photo: juergenmai.com

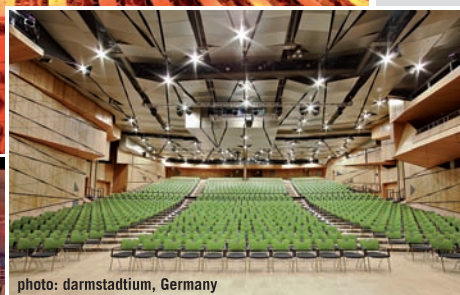


photo: darmstadtium, Germany

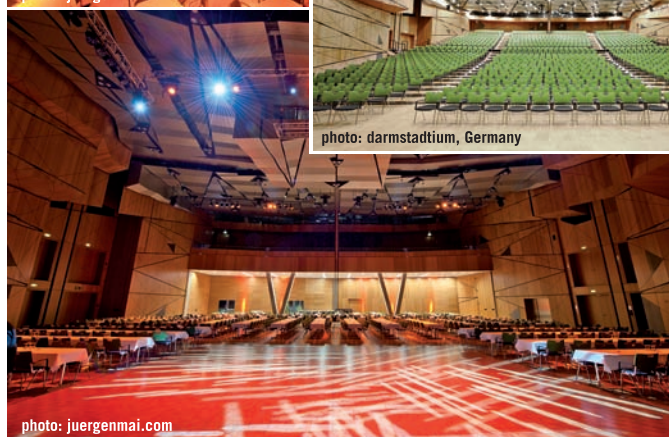
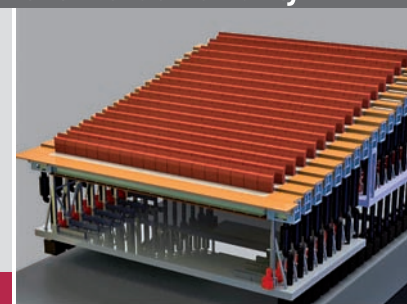


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# Multi-tasking

The Cyprus National Theatre in Nicosia is just one of a number of successful projects Multistage has carried out in the region



**S**tage engineering company Multistage International is being kept busy overseas, following its successful tender for the Cyprus National Theatre in Nicosia. Working for joint venture company Telmen Eracleous, UK-based Multistage is involved with the design, supply and commissioning of stage machinery, stage lighting systems and audio and communication systems at the theatre, which is to be the new home of the Cyprus Theatre Organisation.

“The stage engineering equipment includes a full Vortek Classic Hoist powered flying system, orchestra pit elevator and associated safety equipment, seating wagons, lighting, sound and AV equipment. Multistage will be responsible for the integration of not just these areas, but also the design, supply and commissioning of all on-site electrics, including equipment such as stage lighting control systems, utilising Strand EC21 dimming systems and Light Palette control desks, full audio system with EAW speakers, plus

paging and stage management systems,” says Multistage director John Tune.

Due for completion in the summer of 2011, the venue, which was designed by Harilaos Kythreotis on behalf of the architectural office of D Kythreotis and Associates, has two stages, with 550 and 150 seats respectively, and includes offices, an exhibition area, a foyer, bookshop, restaurant and cafeteria.

## **Forward planning**

Supporting the number of projects that Multistage work on in the area is director Mike Rowntree, who is based in Cyprus. For the Cyprus National Theatre he is playing a key role in forward planning and coordination for all electrical supply, as well as pulling together the final design for the audio and lighting systems. Rowntree also provides an enormous amount of support to the company’s other clients in the area, for whom Multistage has completed eight different projects over the past five years.



With Rowntree's input and a close working relationship with construction company Atlas Pantou, Multistage is able to perform and deliver particularly well in Cyprus and the eastern Mediterranean. These mutually supportive relationships, together with the fact that Multistage's directors take time to completely understand their clients' requirements, provides the effective personal service that other integrators could struggle with.

For the Cyprus National Theatre, Multistage is once again working with consultant Theatretech, a relationship that goes back some 10 years. "We've worked with Multistage for as long as they've been in existence," says Mick Way, director at Theatretech. "We've always been impressed with their attention to detail, and get on with them extremely well – they are always reliable and consistent. Working overseas, especially in the Mediterranean

region, can be challenging, and technical and cultural differences mean projects don't necessarily progress at the speed you hope for. But Multistage is always on top of things, ensuring the development continues at a good pace."

Elsewhere in the region, Multistage is working on a new video conference theatre at the Palestinian Medical Relief Society in Ramallah, on the West Bank in Palestine, a project adopted by pianist Daniel Barenboim as a way of bringing together young Israeli and Arab musicians.

Multistage also has several concurrent stage engineering projects in the UK, including the rebuilding of the historic Lyric Theatre in Belfast and the new Performing Arts Centre for Yarm School, Stockton-on-Tees. ■

[www.multistage.co.uk](http://www.multistage.co.uk)



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The mysteries of the world's most spectacular water-themed theatres are kept safely hidden behind thousands of meters of black velvet drapes. *The House of Dancing Water*, a show created and directed by Franco Dragone, had its public premiere on 17 September at the Li Chung (Sandi) Pei purpose-built and designed Dancing Water Theater at the City of Dreams in Macau. As one of the main features of Melco Crown Entertainment's leisure oasis City of Dreams, the 2,000-seat state-of-the-art venue combines cutting-edge technologies with a traditional black box theatre. The 270° in-the-round theatre uniquely houses a commercial pool approximately 50m in diameter, 8m deep and holds 3.7 million gallons of water – more than five times the volume held by an Olympic-sized swimming pool.

Draping the cavernous venue might not seem the most challenging aspect of a project of this magnitude where many of the scenic elements are located under water, but the stage fabrics manufactured and installed by ShowTex Hong Kong took the concept of multi-tasking to a new level. With offices around the world and 150 years of experience providing theatrical curtains, tracks and motion control systems, ShowTex has already supplied numerous Franco Dragone productions.

Bim Cheung, ShowTex Hong Kong's managing director consulted on the technical options for the unique design and requirements of the project from early on. She explains: "From the beginning, it was clear that this space would become one of the most iconic concept theatres in the world. The grid alone measures 60m and the intricate special effects

# Behind the curtain

ShowTex provided the drapes that ensure the secrets of shows held at the City of Dreams remain a mystery to the audience



are operated by technical specialists both in the air and under water who must remain invisible to the audience at all times. The drapes create an intimate atmosphere for the dramatic love story on stage, while making sure that what's going on backstage remains secret. The theatre's main curtain, a satin gloss 520gr/m<sup>2</sup> polyester velvet, weighs in at 348kg. ShowTex's flame-retardant Paris CS Velour not only lines the entire building as acoustic masking, but also covers up all the technical equipment, catwalks, grids and wiring. *The House of Dancing Water* will run for at least 10 years and is the ideal environment for our Paris CS velvet, which withstands moisture and achieves the highest flame-retardant standard."

Installation of the drapery was managed and carried out by ShowTex toward the end of the Dancing Water Theater's three-and-a-half-year construction period. Cheung continues: "It was vital that the curtains and track wouldn't



## STAGE TECHNOLOGY

### The spectacular set of *The House of Dancing Water*

interfere with the numerous fly lines. In fact, many of the drapes in the theatre are attached to non-traditional tracks. Custom curved Alu-Pipe is suspended from the grid and carries flat drapes and some smaller Venetian drapes to allow for easy access on and off the various catwalks. Performers magically appear and disappear effortlessly through the velvet."

While *The House of Dancing Water* continues to thrill the public with its magical effects and performances, the secrets to the show's success will remain well hidden behind the curtain. ■

[www.showtex.com](http://www.showtex.com)

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Troia Design Hotel has been meticulously designed and constructed. It offers a mixture of nightlife and cultural activities, including a casino and performing arts centre, plus a conference centre with 70,000m<sup>2</sup> of luxurious facilities.

The venue's stage and show systems demanded the best technology available with the highest flexibility and versatility to allow for different configurations, and Daktronics' rigging systems are ideally suited to manage the varied technical and artistic productions on offer to the hotel's customers. The performing arts centre, with 4,380m<sup>2</sup> of floorspace on three levels, is set to become the main theatrical and cultural venue in the region.

Interior design and stage consultancy were carried out by Lisbon's Arsuna.

Architect Flavio Tirone, Arsuna's general manager, says: "In a contemporary scenic stage facility, moving elements play a vital role in the efficiency of performances. The Daktronics fully automated rigging system and its Vortek hoists are the centerpiece of the stage systems. After great experiences of using Daktronics products in other projects, we felt this was the best solution to fulfil our requirements."

The performing arts centre has been designed to offer two main configurations: theatre; and dining while enjoying the show. The transition from one configuration to another is quick and easy, and special attention was given to offering

# Culture club

Troia Design Hotel's performing arts centre uses the latest technology to offer a diverse programme of entertainment

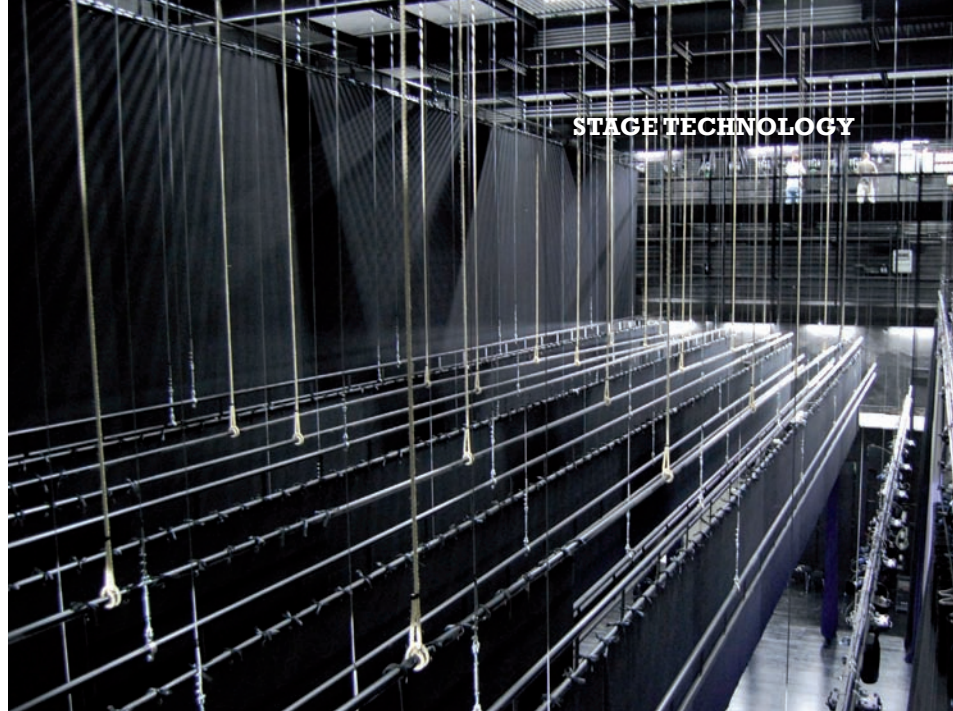
**L**ocated on Portugal's ancient peninsula, Troia is a beautiful natural resort situated between the Sado estuary and the Atlantic Ocean. Surrounded by clear waters and sands that provide a balanced habitat to a wild dolphin community, Amorim-Turismo's

excellent sightlines and comfort. The hall has 550 seats or 400 dining places and is also used in conjunction with the casino and the conference centre. Other configurations are possible with partial or complete auditorium space without seats for pop concerts, corporate and product presentations, dancing and other events.



Amourim Turismo awarded the contract for supply and installation of stage equipment for the new Centro de Espectaculos entertainment centre to the experienced Siemens IS infrastructures business unit. Luis Martins, Siemens' manager for this project, explained why Daktronics rigging was selected: "With the Vortek Automation Center software application, it is possible to create, modify and perform very precise and sophisticated stage equipment movements that will provide complete dynamism and automation to productions. The Daktronics system is also very reliable and completely safe."

The five-star hotel's performing arts centre "represents an innovative project in which Siemens continued its integrated solutions work while using the latest technology systems," says Martins. Daktronics rigging is the at heart of the system: 16 variable speed hoists suspend and



## STAGE TECHNOLOGY

**Variable speed hoists suspend and move 23m-long fly bars with up to 500kg load at the touch of a button**

move 23m-long fly bars, with up to 500kg load, at speeds up to 0.9m/s at the touch of a button.

Thanks to this equipment, Troia's performing arts centre can now offer its customers a diverse programme regardless of the complicated sets and special demands. ■

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# Floor show

Stagestep's new Compass Flooring System offers a flexible, durable and cost-effective portable flooring solution

**Compass flooring panels can be configured with multiple surface types**

Portable floorings can present problems – especially over time – in terms of wear, tear and reliability, and the time and the amount of labour it takes to put them together and take them apart can result in expenditure far exceeding the floor's initial cost. Damage is likely to occur during set-up, breakdown and transportation due to exposed connecting elements. Some of the main problems are: moving parts that wear out; tools needed for assembly breaking or being lost; and inconsistent surface elements such as wood combined with metal that can cause trip hazards. All these factors impact on the reliability and longevity of the floor, and the safety and performance of those using it.



With the flexibility and versatility of portable floors being compromised by expense and upkeep, Stagestep, a worldwide distributor and installer of flooring for dance, theatre, sports and performance, came up with a solution. "We gave a lot of thought to these issues and asked ourselves

if it was possible to address our clients' need for a floor that could withstand wear and tear, as well as offering high performance and safety," says Randy Swartz, president of Stagestep. "So we took on the challenge and developed the Compass Flooring System."

The key to the system is two-fold: its use of modular elements and its unique locking system. Simply put, Compass combines its components, including the surfaces, substrates and sizing, to fit the needs of each client. Swartz explains: "Clients are able to choose from a variety of hard-wearing surfaces, including hardwood, vinyl or plywood. The system's floating subfloor is also very versatile, with a multitude of configurations that conform to the needs of professional and amateur sports, as well as dance, theatre and the performing arts. Considerations include ball bounce, non-slip properties and maintenance.

As well as having a versatile design, the Compass system is also easy to install. Using a unique magnetic system to help prevent damage, installation is simply a case of sliding two pieces of flooring next to each other. Assembly can be carried out in all four directions at the same time without lug nuts, Allen wrenches or other tools, and with recessed connecting elements to help prevent damage. If such damage does occur, all elements of Compass are modular and can be fixed by replacing a single element of the flooring.





Compass can be configured with multiple surface types, resulting in a portable floor with tight-fitting seams. Panels come in 4 x 4ft and 4 x 8ft and storage carts are also available. All panels are interchangeable, eliminating corners, edge and centrepiece configurations, and transitions and edgings are available for all configurations.

For stage use, the Compass floating wood subfloor can, in most cases, be installed in less than an hour and can be equipped with any surface. Since all panels are interchangeable, you have almost endless possibilities for different configurations and the system's competitive price and savings in labour costs make it an attractive proposition. Each Compass floor can be customised to incorporate special finishes, different colours and company logos. ■

[www.stagestep.com](http://www.stagestep.com)



## STAGESTEP Flooring Solutions

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the Performing Arts

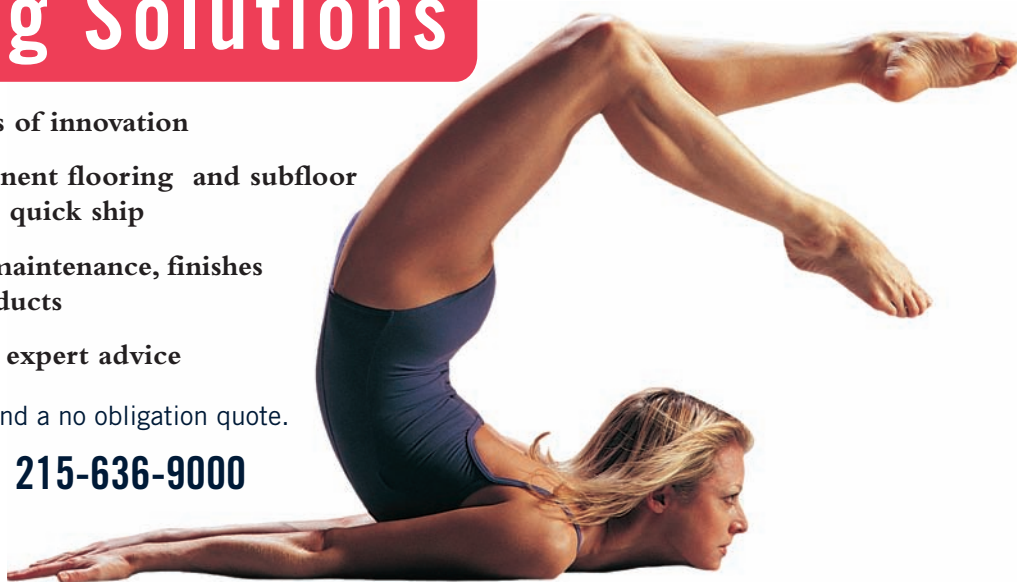
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# Supporting role

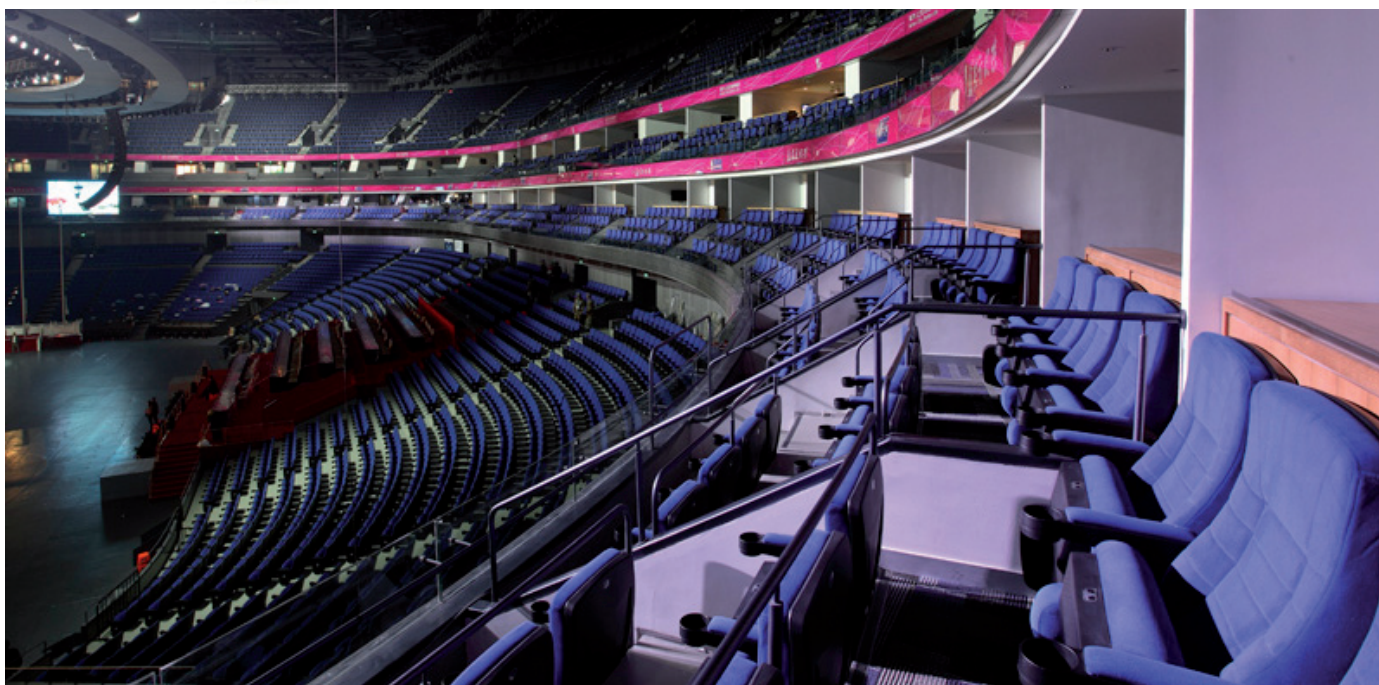
Guangzhou Lijiang Economic Development has added a new seat to its range aimed at auditoria, theatre and cinema markets

**Lijiang's LS-10601P seat (below); Lijiang supplied 2,000 seats for the Shanghai World Expo Cultural Centre (bottom)**



Guangzhou Lijiang Economic Development specialises in researching, producing and selling chairs for auditoria, theatres, cinemas, waiting rooms and other public areas. The company has a seating research and production base located in the Science and Industry Zone in Sanshui city centre in Foshan, Guangdong Province, China. The facility, which opened in March 2009, covers a total area of 80,000m<sup>2</sup>, and the company says it can produce around one million chairs a year.

Lijiang's latest seat for the auditoria market is the LS-10601P model. The 4in-thick seat cushion has an injection-moulded, high-impact polypropylene outer-back with a textured surface for ease of cleaning and maintenance and a foam density of 60±5KG/M<sub>3</sub>. It is also recyclable and therefore eco-friendly. The waterfront seat edge encourages good posture and support and the cold-moulded foam is very durable, meaning the seat will give you many years of service. The seat has an ergonomic 3in-thick back cushion, has a foam density of 55±5KG/M<sub>3</sub>, and is designed with lumbar support to offer occupants both comfort and support.





The LS-10601P has a polypropylene armrest, with a grained surface for scratch resistance, and is available in either a wood stained or solid wood finish. The flip-up arm design allows extra user space and there is also an integrated cupholder. The tip-up seat's counterweight mechanism allows for smooth operation and the seat has a strong steel internal structure (2.5mm-thick/12 gauge).

Other options include: floor/riser mount (standard); movable base (removable); LED aisle light; aluminium seat number plate; choice of colours (black, dark grey and brown); and customised back stitching.

The company also offers a range of 'European style' seating for theatres and auditoria (the LD series) and has launched two new ranges of VIP seating to address customer demand. ■



The Shanghai World Expo Cultural Centre

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# Q&A



Mauricio Olarte, CEO at Series Seating, studied industrial design at Pratt Institute in Brooklyn, New York. He holds several patents and has been designing seats for more than 30 years

## What are some of Series Seating's most recent projects?

We have been working on custom products for various corporate and performing arts auditoria. Some corporate auditoria we have been working on are: Halliburton Life Center, Houston, Texas; Devon Energy Center, Oklahoma City, Oklahoma; and Encana 'The Bow', Calgary, Canada. Performing arts auditoria we have also been working to provide seating for are: University of South Florida Visual & Performing Arts Center, Tampa, Florida; Reva and David Logan Center for Creative and Performing Arts, Chicago, Illinois; Palladium Concert Hall, Carmel, Indiana; and Film Society of Lincoln Center, New York.

## What challenges have you encountered on these projects?

Current challenges have been providing smaller chairs, tighter envelopes, all the while making them more comfortable, as well as providing quieter and smoother movement of seats when closing to the unoccupied position. Additionally, all of these projects have required customisation in terms of the formalisation, function and aesthetics of the chair. All projects require the use of different finishes such as wood, metals, fabrics. But sometimes the challenge that we face

on custom projects is tying those into the form, function, and structure of the chairs.

Another example would be the Winspear Opera House (pictured left), where the chair was adapted for use in the different locations within the venue, where we had more than 50 different variations of end panels, which is essentially 50 different chairs. On some projects it goes as far as designing a custom chair for every specific location on a 2,000-seat project, where every individual seat is shipped from our factory, with a specific intended location on the project.

## What are the current trends in demand for auditoria seating?

Current trends in demand are for seats that are multi-faceted with features such as rocker backs, cupholders and easier removable seating. However, the challenge with such trends is to satisfy the demands of architects and theatre consultants, as well as complying with and meeting codes and acoustic standards. We are also seeing an increase in demand for customisation of seats in smaller projects.

## What new technology is emerging?

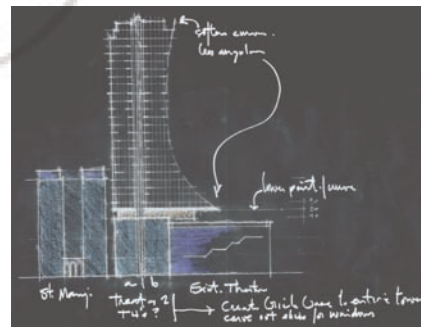
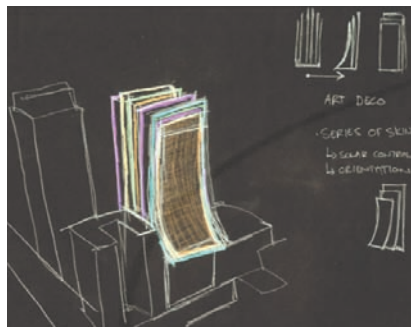
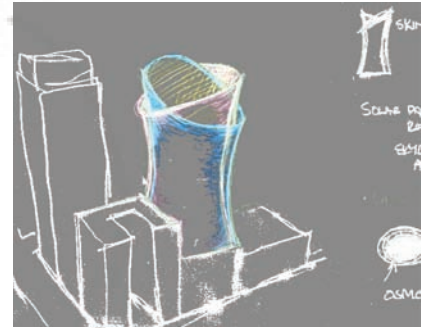
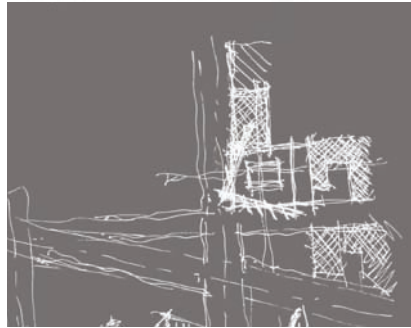
We have been using a precision mechanism that controls gravity so that the movement of seats is dynamic, smooth and quiet, with no bouncing. ■

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