

9 February 2016

ASTC Fellows Review Committee

Dear Review Committee:

It is with great pleasure that I sponsor Robert Shook, ASTC, for elevation to Fellow of the ASTC. Robert's achievements in our field and his leadership and service to our Society make him worthy of this distinct honor.

Bob has contributed to our field for over 35 years, leading the planning and design of many outstanding theatre projects in the United States and Australia. Bob is a self-made leader in our field. While enjoying a career as a stage lighting designer, Bob began his career as a theatre consultant in 1980. In 1986, he partnered with Duane Schuler to found Schuler Shook, a consulting firm in Theatre and Lighting Design. Bob was responsible for the growth and development of Schuler Shook and has led the firm to its current status of 44 professionals in three U.S. cities and in Melbourne, Australia. He has designed hundreds of performance spaces that attain the very best in theatre intimacy, function, and impact for their patrons.

Bob's commitment to the ASTC is vigorous and unwavering. He was accepted as a full Member in 1994 and was named President the following year. He created The ASTC Letter, our inaugural newsletter, and was its publisher for over ten years. He has continued to serve the ASTC ever since, providing guidance through the Publications Committee. Bob promotes our Society to all potential members; he has particularly encouraged all potential members at Schuler Shook to become members, and he has led our firm's commitment to support staff member attendance at ASTC meetings.

Robert Shook is among the most worthy of this honor of Fellowship. Attached are recommendation letters from Robert Davis, FASTC, and Michael McMackin, ASTC, a select biography of Robert's accomplishments, and print materials that detail some of his achievements. Thank you for your review.

**PARTNERS**

Michael DiBlasi  
Todd Hensley  
Jim Baney  
Jack Hagler

**SCHULER SHOOK**



**DIRECTORS**

Duane Schuler  
Robert Shook

Todd Hensley, ASTC

**Robert Davis Inc.**

200 Cabrini Blvd. #95 New York NY 10033 (212) 927 8822

26 January 2016

ASTC Fellows Committee  
c/o Todd Hensley  
Schuler Shook  
750 North Orleans Suite 400  
Chicago IL 60654

re: Nomination of Bob Shook for election as a Fellow of the ASTC

Dear Fellows Committee,

With great pleasure I recommend Bob Shook for election as a Fellow of the American Society of Theatre Consultants.

Continuously through years of planning important rooms of great stature Bob embodies the best of our profession.

Continuously through years of dedicated service to the ASTC Bob embodies the best of our organization.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert Davis". The signature is fluid and cursive, with the first name "Robert" and last name "Davis" clearly distinguishable.

Robert Davis, FASTC



February 4, 2016

Todd Hensley, ASTC  
American Society of Theatre Consultants  
P.O. Box 22  
La Luz, New Mexico, 88337

Dear Todd:

Pursuant to our conversation I enthusiastically support Bob Shook, ASTC for Fellow of the Society. Bob is a past ASTC President from 1995 to 1998 and has been an important contributor to ASTC leadership for many years. As a founding partner of Schuler Shook during a span 30 years Bob has been instrumental in over 100 theatre projects domestically and abroad. Bob's expertise includes not only theatre consulting but lighting design. He is a Fellow of the IALD and a recipient of the Ohio University Medal of Merit. His significant contributions to ASTC and to the theatre architecture industry through design work, teaching and presenting on a variety of topics at numerous industry conferences make him worthy of this distinguished honor.

Sincerely,

Mike McMackin, ASTC

## **ROBERT SHOOK, ASTC**

### Education

1972 – BFA, Goodman School of Drama / Art Institute of Chicago – Lighting Design

1974 – MFA, Ohio University – Production Design

### Work History

1974-75 – Grand Stage Lighting – Assistant Manager

1975-77 – Catholic Television Network of Chicago – Lighting Designer

1977-80 – Art Drapery Studios – Design Draftsman, Estimator

1980-90 – DePaul University – Instructor, Lighting Design & Drafting

1972-2005 – Freelance Theatrical Lighting Designer

    Victory Gardens Theatre – Resident Lighting Designer

    Goodman Stage2 – Resident Lighting Designer

    Indiana Repertory Theatre – Resident Lighting Designer

    Chicago Shakespeare Theatre – Resident Lighting Designer

1980-1986 – Theatre Consultant and Architectural Lighting Designer

1986-present – Schuler Shook – Founding Partner

### Awards

1990 – Joseph Jefferson Award for Lighting Design – Cymbeline, Chicago Shakespeare Theatre

1991 – Joseph Jefferson Award for Lighting Design – Macbeth, Chicago Shakespeare Theatre

1994 – USITT Honor Award – Martin Theatre Renovation, Ravinia Festival, Highland Park, IL

1998 – USITT Merit Award – Skyline Stage, Chicago, IL

2005 – USITT Merritt Award – Lookingglass Theatre, Chicago, IL

2016 – USITT Honor Award – DePaul University Theatre School, Chicago, IL

### Presentations / Seminars

Theatre Engineering & Architecture Conference

    2010 – “The Front Door: Modern Front of House Design”

North American Engineering & Architecture Conference

    2008 – “The Role of the Architect in Theatre Facility Design”

Theatre Communications Group

    2005 – “Top 10 Blunders in Theatre Planning”

    2006 – “Buildings for Tomorrow’s Audience: What do our Theatres Need?”

    2007 – “Making Flexible Truly Spectacular”

USITT National Conference

    1997 – “What is a Theatre Consultant?”

    2007 – “Making Great Multipurpose Theatres”

    2007 – “Lighting for Museums and Galleries”

    2009 – “Architectural Dimming and Controls”

    2009 – “Evolution in the Design of Front of House Spaces”

    2010 – “Keys to Collaboration: Successful Teams and Buildings”

    2010 – “It’s Not Just Lighting the Stage Anymore – Crossover and Lighting Design”

    2015 – “Modern Concert Halls: Accommodating Expanding Needs”

AIA Annual Conference

1996 – “Design of Performing Arts Facilities”

IAVM National Conference

1997 – “Successes and Classic Blunders in Theatre Design”

#### Published Articles & Books

“The Many Lives of Our Lobbies” – Auditoria Magazine, April 2006

“Lighting for Worship Spaces” – Faith and Form Magazine, January 2009

“Out of the Ordinary: Pritzker Pavilion in Millennium Park” – Auditoria Magazine, January 2005

“Taking Centre Stage: McCaw Hall” – Auditoria Magazine, January 2004

“Designers at Work: Robert Shook” – Scene Design & Stage Lighting, R. Craig Wolf and Dick Block

#### Significant Theater Consulting Projects

##### **Professional**

Lookingglass Theatre – Chicago, IL

Victory Gardens Theatre – Chicago, IL

Black Ensemble Theatre, Chicago, IL

Central Square Theatre – Cambridge, MA

Skylight Music theatre – Milwaukee, WI

Court Theatre, Chicago, IL

##### **Opera and Concert Halls**

Renovation of New York State Theatre / David H. Koch Theatre – Lincoln Center, New York, NY

Jay Pritzker Pavilion – Millennium Park, Chicago, IL

McCaw Hall – Seattle Center, Seattle, WA

Renovation of Hamer Hall – Arts Centre Melbourne, Melbourne, Australia

Detroit Orchestra Hall – Detroit, MI

Renovation of Ravinia Festival Pavilion – Highland Park, IL

Renovation of Civic Opera House – Chicago, IL

##### **Civic**

Dallas City Performance Hall – Dallas, TX

Harris Theatre for Music & Dance – Millennium Park, Chicago, IL

RiverEdge Park Amphitheatre, Aurora, IL

##### **Educational**

DePaul University Theatre School – Chicago, IL

Logan Center – University of Chicago, Chicago, IL

Ryan Music Center – Northwestern University, Chicago, IL

Old Town School of Folk Music – Chicago, IL

Valparaiso University Center for the Arts – Valparaiso, IN

Singapore American School – Republic of Singapore

International School of Beijing – Beijing, China

##### **Worship**

Willow Creek Community Church – South Barrington, IL

Kensington Community Church – Troy, MI

## ASTC

1992 – Accepted as Associate Member

1994 – Accepted as Full Member

1995-98 – President

1996-2006 – Editor, The ASTC Letter (First ASTC Newsletter)

2006-Present – Publications Committee

## Significant Contributions to the Field of Theatre Consulting

Editor of The ASTC Letter 1996-2006, including authoring or co-authoring the following articles:

“How Far is Too Far – A Discussion of Maximum Seating Distance”

“The Who, What, When, Where, Why, and How of Theatre Project Costs”

Advocate of The New Front of House, which holds that theatres lobbies should be open all day, should attract the public with food and retail, and should be designed and equipped to host event rentals.

Developed specification for the Quiet Rope Lock, which utilizes rubber bumpers and fiber washers to silence the operation of the manual rope lock.

## Other Related Organizations

United Scenic Artists, Local 829 – Midwest Vice President 1977-78

International Association of Venue Managers

International Society for the Performing Arts

American Institute of Architects – Professional Affiliate

US Institute for Theatre Technology – Midwest Board of Directors 1974-76

## Michael Merritt Endowment Fund / Michael Merritt Awards

Founding member of the Steering Committee, Chairman of Steering Committee 2002 – 2008. This endowment is named for a nationally recognized theatre scenic designer who died in 1992, and it provides funding for scholarships for theatre design students, as well as recognizing national and local theatre designers and backstage personnel with awards of excellence annually.

[www.merrittawards.org](http://www.merrittawards.org)

## Contributions to Architectural Lighting Field

International Association of Lighting Designers – Fellow

International Association of Lighting Designers – Board of Directors 2007-10

Illuminating Engineering Society – Houses of Worship Committee 2007-present

Presented 10 education sessions at LightFair, IALD Enlighten Americas, and IALD Enlighten Europe

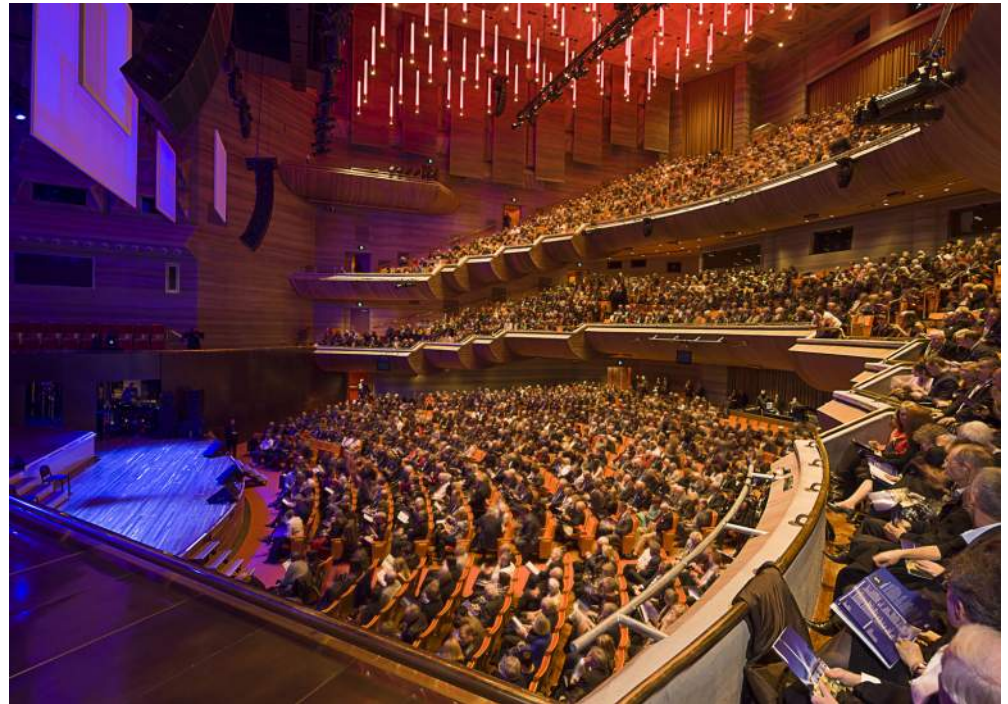
Judge for IALD Illumination Awards, 1998 and 2005

Judge for GE Edison Awards, 2015

Presented with nine international lighting design awards

## ARTS CENTRE MELBOURNE - HAMER HALL MELBOURNE, VICTORIA, AUSTRALIA

THEATRE PLANNERS  
Schuler Shook 



Schuler Shook provided theatre planning services as part of the redevelopment of Arts Centre Melbourne. We are involved with multiple public sector clients for this project including Major Projects Victoria, Arts Victoria, and the Arts Centre as well as other stakeholders like the Melbourne Symphony Orchestra. We assisted in the master planning for the entire Arts Centre including public spaces, backstage areas, and exterior plazas as part of a larger Southbank Cultural Precinct Redevelopment project.

Our scope involved renovation of the 2,400-seat Hamer Hall, home to the Melbourne Symphony Orchestra, heritage listed for both exterior and interior. Improvements include an extensive automated folding reflector system and a new grid which make Hamer Hall capable of supporting a wider array of performance types, including film, with production demands that go beyond the hall's original capabilities.

**SCOPE OF WORK:** Planning and full tender documents for seating, lighting, rigging, and lift.

**BUDGET:** AUD\$128 million

**OWNER:** Major Projects Victoria  
Contact: Annette Pitman, Project Director,  
+61 434 600 693

**ARCHITECT:** ARM Architecture  
Contact: Ian McDougall, +61 3 9629 1222

**COMPLETED:** 2012

# DALLAS CITY PERFORMANCE HALL

DALLAS, TEXAS

THEATRE PLANNERS  
Schuler Shook 



This new performance facility addresses the needs of small and mid-sized professional performance groups. Located in the Dallas Arts District, it includes a 750-seat music theatre, multilevel lobby, function space, backstage support spaces, and offices as the first phase of a two-phase project. The next phase, when completed, will include two flexible theatres, an art gallery, a café, and rehearsal and classroom space.

Schuler Shook led the programming phase of the project, which involved interviewing and interfacing with 69 users and stakeholders, ranging from theatre to ensemble music to ethnic dance to film presentation. We then further developed technical criteria and actively assisted in the design of the stage, seating plan and section, integration of technical levels, and back of house support spaces to provide for all of the needs of the potential users without substantial compromise in any area. We also provided architectural lighting design for the theatre and lobby.

**SCOPE OF WORK:** Programming, user interface, budgeting, theatre planning, stage design and full tender documentation for seating, dimming and rigging systems.

**BUDGET:** \$40 million

**OWNER:** City of Dallas  
Department of Public Works  
Thomas Wurtz 214-948-4541

**ARCHITECT:** SOM / Corgan Associates  
Nancy Abshire, Architect 312-360-4524

**COMPLETED:** 2012

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



## DAVID H. KOCH THEATER NEW YORK, NEW YORK

THEATRE PLANNERS  
Schuler Shook 



Schuler Shook led the design team for a feasibility study for the renovation of the 2,600-seat theatre for New York City Opera and New York City Ballet in Lincoln Center. In a relatively short period of time, we earned the trust and confidence of both companies and completed the project from design to construction administration.

The renovation includes an expansion of the orchestra pit and the introduction of mechanized lifts in the pit to provide a higher level of flexibility and acoustical quality. Also included are the complete renovation of the stage lighting system - including expansion of front of house lighting positions, a comprehensive video capture system, new audience seating, a new fire curtain, new stage lighting ladders, and renovations to most front of house and back of house areas.

**SCOPE OF WORK:** Theatre planning and equipment systems design.

**BUDGET:** \$107 million

**OWNER:** City Center for Music and Drama  
Mark Heiser, NYST Managing Director  
212-870-5505

**ARCHITECT:** JCJ Architecture  
Stewart Jones, now with M+J Architecture  
646-257-5231

**COMPLETED:** 2009

# BLACK ENSEMBLE THEATER

CHICAGO, ILLINOIS

THEATRE PLANNERS  
Schuler Shook 



Schuler Shook provided full theatre consulting services for the new 50,000 square foot home for Black Ensemble Theater, a professional company that specializes in musical theatre. The new building houses a 300-seat thrust stage theatre and a 200-seat black box space. The new facility serves as a cultural center and supports the theatre company's mission of education, art and community outreach.

SCOPE OF WORK: Theatre consulting, planning and equipment design.

BUDGET: \$20 million

OWNER: Black Ensemble Theater  
Jackie Taylor, Artistic Director  
773-769-4451

ARCHITECT: Morris Architects/Planners

COMPLETED: 2011

# MARION OLIVER McCRAW HALL

SEATTLE, WASHINGTON

THEATRE PLANNERS  
Schuler Shook 



Marion Oliver McCaw Hall Lobby



Marion Oliver McCaw Hall Auditorium

The former Seattle Opera House was woefully in need of renovation, in order to properly support the needs of its resident companies – Seattle Opera, Pacific Northwest Ballet, and Seattle Center.

Schuler Shook participated in the project's Action Plan, which laid the groundwork for this ambitious project. Schuler Shook led the user interview process, meeting with various departments within each company on numerous occasions, in order to determine needs in all areas. Schuler Shook worked closely with all of the technical staffs to become familiar with the existing backstage production systems, and to recommend equipment upgrades and replacements as part of this renovation. Schuler Shook was responsible for providing full theatre consulting services and technical systems design for this significant renovation.

**SCOPE OF WORK:** Planning and full consulting services for addition and renovation of 3,000-seat theatre.

**OWNER:** City of Seattle, Seattle Center Foundation  
Jill Crary, Project Manager, 206-684-7107

**ARCHITECT:** LMN Architects  
Mark Reddington, AIA, 206-682-3460

**COMPLETED:** 2003

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

**RIVEREDGE PARK**  
AURORA, ILLINOIS

THEATRE PLANNERS  
Schuler Shook 



The City of Aurora desired a gathering place downtown in a natural setting, complete with an outdoor venue for performing arts. RiverEdge Park is the result.

Schuler Shook provided theatre consulting and architectural lighting design services for the new John Dunham Pavilion located in the 30-acre festival park along the Fox River. Designed for amplified music and live theatre, the pavilion seats 6,000. Programmable color-changing lighting is integrated into the architecture of the pavilion, allowing for a range of effects, and large video screens allow for a closer view of the performers on stage.

**SCOPE OF WORK:** Theatre consulting, planning and equipment design; architectural lighting design.

**BUDGET:** \$13 million

**OWNER:** City of Aurora

**ARCHITECT:** Muller + Muller  
Contact: David Steele, 312-432-4180

**COMPLETED:** 2013

**Theatres**  
**Convention centres**  
**Concert halls**  
**Cinemas**  
**Arenas**

# Auditoria

February 2004



**Entertainment venue design, operations & technology**

# Taking Centre stage

Mark Reddington, LMN Architects and Robert Shook, Schuler & Shook, USA

**The redevelopment of a major opera house into a modern performance space is the perfect showcase for performers and design team alike**

**M**arion Oliver McCaw Hall, which opened in June 2003, has become the centerpiece of the Seattle Center performing arts district, and home to two of the USA's premier performing arts companies: the Pacific Northwest Ballet and Seattle Opera. The performance hall, formerly the Seattle Opera House, anchors the arts district that defines the urban edge of the Seattle Center; a civic, cultural and entertainment campus that was originally built to accommodate the 1962 World's Fair.

The US\$127m, 294,935ft<sup>2</sup> redevelopment includes new public lobbies and an arrival court, complete restructuring of the interior plan, replacement of the five-story building envelope, extensive life safety and seismic improvements, new mechanical, electrical and theatrical systems, a renovated rehearsal hall, new backstage spaces and a redesigned 2,900-seat performance hall.

Although portions of the auditorium embrace both the original auditorium structure of 1928 as well as the 1962 renovation, design modifications significantly reconfigure the hall

to improve sightlines, acoustics and intimacy within the hall. A 400-seat lecture hall, café and lounge spaces for performers and patrons have also been added.

The design team involved a multi-disciplinary collaboration including users (Seattle Opera, Pacific Northwest Ballet, Seattle Center); LMN Architects; Schuler & Shook, theatre consultants; Jaffe Holden Acoustics, acoustical design; Sussman/Prejza Inc, interior design; Gustafson Guthrie Nichol Ltd, landscape designer; Leni Schwendinger Light Projects Ltd, lighting artist; Horton Lees Brodgen Lighting Design, lighting designer; and set designer Robert Israel as design consultant.

The project's mission was to create a contemporary performance hall, leveraging the opportunities of modern theatre technology and staging to support both the performance as well as the overall project design. The team studied and reinterpreted the lessons of historic theatres, ranging from the populist community experience of the Commedia del Arte to the high drama of the Paris Opera House, creating a strategy to design a truly modern performance hall that connects the art form with contemporary culture. The result is a design approach that makes a direct connection between the art of the performance on stage and the extroverted expression of the building as an event for the community.

## Theatrical experience

The approach focused on designing a carefully choreographed theatrical experience for the visitor. Designed as a sequence of events culminating with the presentation of the performance within the hall, the experience is shaped by the nature of the architecture. The act

of attending a performance is transformed into a theatrical event as the ephemeral qualities and sensations of the performances extend beyond the stage out into the streetscape.

The grand lobby faces a pedestrian corridor that connects Mercer Street, an urban traffic arterial, to the Seattle Center campus. The fixed, historical building footprint left no allowance for a traditional public sequence that aligns significant urban spaces and lobbies leading to the performance hall. Therefore, the team developed an alternate design strategy that

**The approach focused on designing a carefully choreographed theatrical experience for the visitor**

overlaps the audience sequence of entry to the hall with public spaces connecting the campus to the community. This public space, the Kreielsheimer Promenade, integrates an exterior courtyard and interior lobbies with a unified spatial gesture. The separation between interior and exterior spaces is defined by a five-story serpentine glass wall intersected by a three-dimensional field of metal scrims. Compositions of choreographed color and light are projected on and through the scrim layers to cast a series of visual events, extending the



**[Above]** Three-dimensional visualization techniques were used to ensure that all seats in the new forward-facing audience boxes have excellent sightlines

**[Left and overleaf]** Choreographed colored light is projected through the scrim layers of the five-story serpentine glass wall to cast a series of visual events

**[Below]** A grand stair rises four stories within the grand lobby space

[Images] Lara Swimmer, Swimmer Photography; Fred Housel, Housel Photography; Gustafson Guthrie Nichol Ltd



theatrical experience into the streetscape and inviting the entire community to participate. Underfoot, thin sheets of active water swathe the walkway, reflecting the movements of each passerby within the color animation.

### Inside and out

The sequence continues into the lobby through a series of spaces characterized by overlapping curvilinear shapes and interactive light surfaces. The field of nine stainless-steel scrims spans the exterior courtyard and penetrates the window wall, creating an interlock between the exterior court and interior lobby spaces, and framing a grand stair rising four stories within the space. The colors and reflective quality of the interior and exterior elements were carefully selected to blur the distinction between the inside and outside. They progress to increasingly deeper colors as they approach the stage, culminating in a black proscenium framing the performance.

The auditorium was redesigned to create a new sense of excitement, enhanced acoustics and an intimate connection between the audience and the performance. This was achieved by combining dramatic colors and materials, architectural lighting that incorporates colors and theatrical projections, and major changes to the room dimensions and seating configuration. The auditorium width was reduced by 32ft, eliminating the most problematic seats in the original seating plan. Both of the balconies were extended toward the stage with two new seating rows, and new, steeply sloped side-seating galleries were created along the sides of the room to connect the orchestra-level seating with the first balcony.

These galleries are beneficial from two standpoints – they make the room feel narrower than it actually is, and they provide audience members in these areas with excellent vertical sightlines. In addition, new forward-facing audience boxes were created at two upper levels. The placement and design of these boxes was one of the most difficult design challenges. Many examples of forward-facing audience boxes from post-war opera houses yielded poor sightlines. The new McCaw Hall audience boxes were studied at length, using three-dimensional visualization techniques, to ensure that all seats have excellent sightlines.

Although the reduced width of the auditorium is beneficial for visual intimacy, it was acoustically necessary to retain the cubic volume within the room created by the original room dimensions. Therefore, the new walls that reduce the width of the room are solid at their lower levels where they support the new seating boxes and they transform to open metal grilles at their upper levels to acoustically combine the adjacent cubic volume to that of the room. These coupled spaces, visible from the auditorium, are treated with deep red surfaces and red lighting to create a dramatic entrance gallery for the upper boxes.

The increasing production capabilities of the Seattle Opera and Pacific Northwest Ballet required that the stage be enlarged. The rigging gridiron was raised from the original height of 80ft to 100ft. The wing space on stage left was increased and a new 80ft-wide scenery



handling area was created to allow large scenic units to be easily shifted into place. In addition, two new receiving areas were created, one 2,700ft<sup>2</sup> dock for two trucks at stage level, and one smaller two-truck dock at the lower level, aligning with the trap room. A large scenery lift connects these two levels, making it possible to load in from both loading docks simultaneously.

Many improvements were made in the orchestra pit, including the removal of two structural columns that previously obstructed views of the conductor. A critical and very

## The theatrical experience of attending an event extends out into the surrounding cityscape

challenging element in the pit design is the method to supply conditioned air in this area. It is necessary to supply air from as many different locations as possible, to allow orchestras to arrange themselves in many different configurations, and to keep the air volume low in order to minimize drafts and noise from the air system. This issue is further complicated by the fact that most of the orchestra pit floor was a mechanized lift platform that will often be raised to stage level depending on the type of performance.

The team created a new approach to this longstanding challenge. The solution was to install sheet metal plenums for pressurized air below the lift platforms and drill thousands of small (1/8in) holes in a tight pattern across the entire surface of both lift platforms. This provides a system whereby the air rises very slowly through the floor and at the same time allows musicians to cover some of the air supply holes with chairs and music stands without compromising the system.

New theatre technical systems include rigging, lifts and lighting. The primary

components of the new rigging system are 112 manual rigging line sets and 30 variable-speed motorized winches (point hoists). The orchestra pit lifts were replaced with new mechanisms, controls and platforms. A new two-level stage trap system was designed that allows for the creation of 9ft-deep traps or 25ft-deep traps at any area within the trap zone.

The new stage lighting system included a new front-of-house catwalk position that was carefully integrated into the ceiling architecture along with a raised proscenium and new forestage reflector, as well as new box boom positions that blend seamlessly with the architecture of the new auditorium side walls. New balcony front stage lighting rails were designed, and new enclosures were installed at each end of the seating mezzanine for scenic projection; these enclosures assure that neither the noise nor the heat of the projectors interferes with the audience's enjoyment.

In addition to addressing the technical needs of the theater, McCaw Hall also features sustainable design strategies that further enhance the project. It is one of the few performance halls within the USA to be targeted for a LEED<sup>SM</sup> Silver certification. The renovation implements numerous sustainable design strategies with a commitment to the cultural and natural environment as well as energy conservation, reuse and integration. The building achieves improved energy performance by using wide-ranging strategies integrated into the design such as low-energy theatrical lighting and a dynamic lobby that incorporates a naturally ventilated "chimney", created by motorized internal blinds.

### Contemporary culture

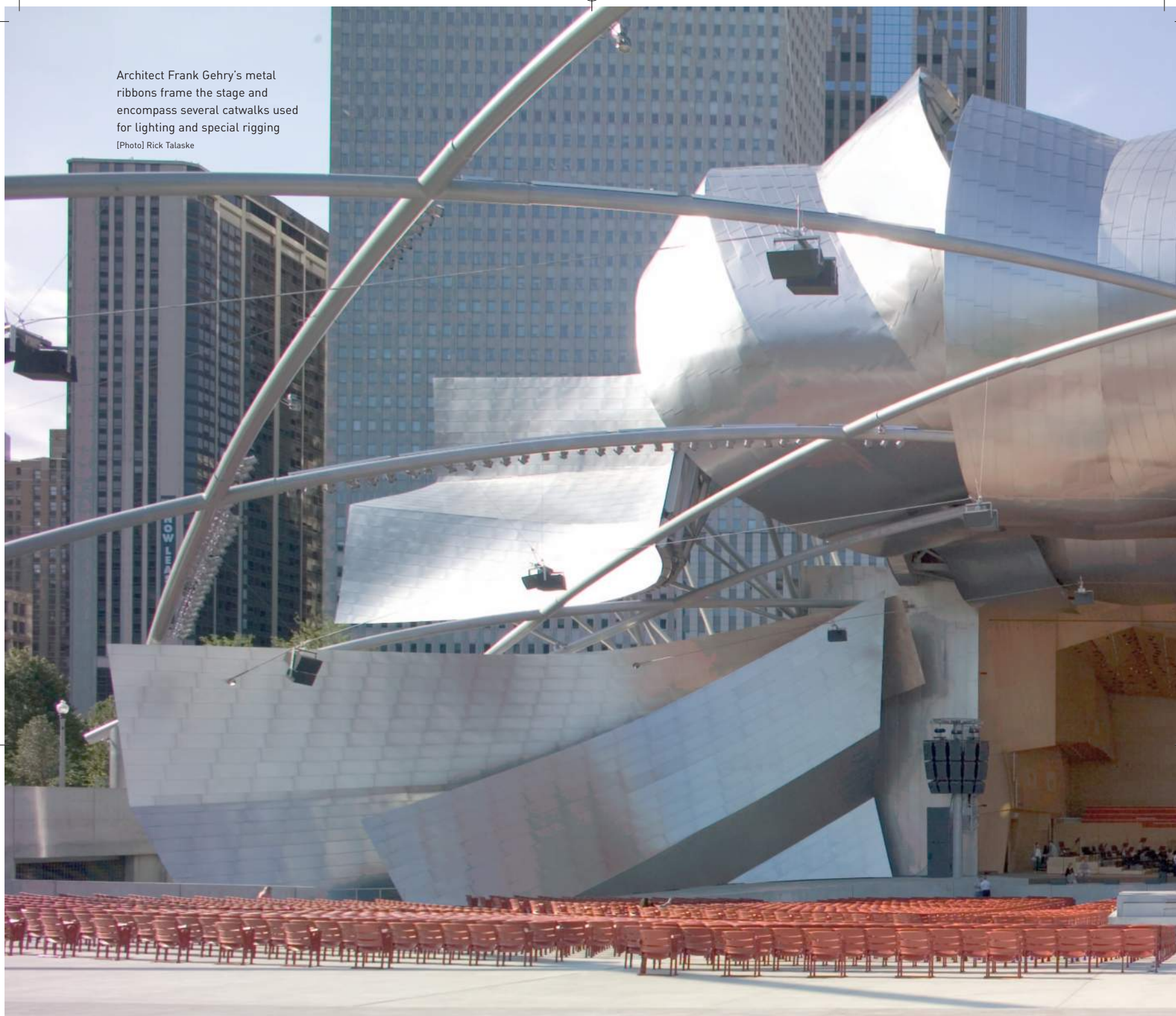
The project has been a great success, not only in serving the performance needs of the users on stage, but also in capturing the interest and imagination of the community. The theatrical experience of attending an event extends out into the surrounding landscape and cityscape. The building regularly engages thousands of non-audience visitors in an artistic experience.

Through an approach that integrates architecture and theater design it creates a form in which the traditions of opera, ballet and theater are alive and thriving in the contemporary culture of Seattle's community. ●



Architect Frank Gehry's metal ribbons frame the stage and encompass several catwalks used for lighting and special rigging

[Photo] Rick Talaske



# Out of the ordinary

Pritzker Pavilion is an exuberant venue at the heart of Chicago's Millennium Park

Robert Shook ASTC and Todd Hensley ASTC, Schuler Shook, USA

Chicago is a city that shapes itself. It goes to great lengths to adjust the landscape to its plans – even to reverse the flow of a river if that suits its purposes. So it should hardly be surprising to anyone that when Chicago decided to build an expansive art-filled 24.5-acre cultural park in the heart of the crowded metropolis, Mayor Daley simply created

the space to do it. These found acres of green space, which are dotted with some of the world's best new public art, also now serve as the home of the Grant Park Music Festival, featuring the last free civically funded orchestra concerts in the USA. Both an artistic statement of bold modern architecture and a 21st-century engineering feat, Millennium Park is actually a giant bridge constructed over an

ugly scar in the earth and working commuter railroad tracks. It's a former no-man's-land that is rapidly becoming the place to be in Chicago.

The space – a longtime eyesore in Chicago's most architecturally significant area – is adjacent to the beaux-arts grandeur of Grant Park, just east of Michigan Avenue and north of the Art Institute of Chicago. Outfitted with extensive landscaping, as



well as public gathering and entertainment spaces, Millennium Park creates an illusion that you are striding on terra firma when you are in fact 45ft above it. It's been called many things – a sculpture garden on steroids, a big green roof, a super-sized park on hidden stilts – and has the unique benefit of parking for the park under the park. But it is undoubtedly Chicago's most significant outdoor cultural project in more than 100 years.

The exuberant – some might say gutsy – Frank Gehry-designed Jay Pritzker Pavilion is the centerpiece of this new Chicago landmark. Designed to fit the spirit of the city, the pavilion is both bold and celebratory. The design team included Talaske, acousticians; Skidmore, Owings & Merrill, structural engineers; and Schuler Shook, theatre planning consultants and lighting designers.

The planning for both Millennium Park and the Pritzker Pavilion evolved – and expanded – over a

period of time. Schuler Shook became involved in 1998 to act as theatre planning consultants for a “bandshell”, which was somewhat understated in scope. First conceived as a rather modest extension to Grant Park, the scale of Millennium Park increased exponentially when individual and corporate donors became involved.

### Elaborate statement

When the Pritzker family, longtime friends of Frank Gehry, drew him into the project, the low-key bandshell shifted to a larger, more elaborate architectural statement. At the time Gehry Partners became involved, the rest of the design team was on board and design was substantially under way. Gehry very much honored the existing criteria, introducing new solutions for production support and bringing his unique vision to the artistic design. The pavilion stage itself, with an effective

performance zone that is 85ft wide and 38ft deep, is large enough to hold a full symphony orchestra, with additional room for a 150-member chorus behind. Custom 50ft-high steel and glass doors at the proscenium line can roll in from the sides, enclosing or exposing the stage as required. These glass doors effectively render the space weather-tight, allowing it to be used as a gathering space for social events, even in the midst of Chicago winters. In the summertime, the stage is air conditioned during performances.

The orchestra riser system, conceived by Talaske and detailed by Schuler Shook, allows the musicians to hear, see and feel one another's music more effectively, while at the same time allowing the audience to see the performers better. Pritzker's riser system is unique in that it includes special resilient mounts that hold the platform lids off their support legs, allowing the assembled lids to act as

## ARCHITECTURE AND DESIGN

a drum-head, transferring vibrations across the stage more efficiently. The stage floor itself is constructed of jarrah wood, which is similar to teak in appearance and weather-proof characteristics, but stronger and more durable.

The boldly curving proscenium of the pavilion soars 120ft high and is supported by massive 11ft-tall steel trusses that cantilever more than 100ft out from their vertical supports. It is covered in 679 stainless-steel panels that are both artistic and functional, serving as sound projection surfaces and framing the stage to help the audience – especially those seated on the lawn behind the fixed seating – focus on the on-stage activities.

## Steel and glass doors can roll in enclosing the stage, allowing it to be used as a space for social events

This cantilevering structure houses two lighting catwalks and a follow-spot catwalk, and it also shades the stage from direct sun during afternoon rehearsals. Appropriately enough, the rear of the bandshell exposes the structural framework, resembling the backside of a stage set.

The audience seating for 11,000, including 4,000 fixed seats plus lawn seating for 7,000, is spanned by an open crisscrossing steel trellis. The addition of this structure was one of the substantial changes to the original concept. This series of curved metal tubes – 600ft long by 320ft wide, which reaches to heights of 60ft – serves a variety of purposes. The trellis defines the entertainment space, subtly setting it apart from the rest of the park and emphasizing the connection between the performers and the audience. It also supports the sound reinforcement/enhancement system and the architectural lighting.

This is a significant departure from the

conventional arrangement of placing poles in a sea of grass from which production equipment can be mounted. Neither the mayor nor Gehry liked the idea of speakers on poles scattered about, so Gehry designed this artistic solution, which looks very much like radio waves emanating from the stage house. The pavilion is the first orchestral venue to distribute sound using this type of overhead trellis; almost 100 speakers are mounted in precise concentric circles radiating from the stage.

Talaska's sound system was designed in three parts. First, there is the acoustic sound, allowing natural sound to reflect off the architectural surfaces. This is supported by reinforcement speakers, electronically delayed to provide the perception that the sound is coming from the stage itself. Finally, acoustic enhancement speakers emulate audio reflections typically found in concert halls, and also help to mask external ambient noise.

Two other design choices helped meet the team's design objectives for superior sightlines for both the seated and the lawn audience. Most stages are designed 3ft 6in above the seating. This stage deck was raised to 5ft, with a downstage apron lip at 4ft. The dropped apron can be used for monitor speaker positions, and it provides improved sightlines for the front rows of fixed seating. In addition, the slope of the seating was increased above the 1998 design, enhancing the sightlines.

### Bright ideas

The primary performers in the pavilion are the Grant Park Orchestra and Chorus. Because the space is used mainly for symphony orchestra and choral performances, the permanently installed lighting system is straightforward. Additional circuitry and company switches accommodate the needs of touring groups with more elaborate production requirements. The trellis supports "house" and exit lighting, plus a battery of accent lights focused on the metal structure itself. The lighting fixtures for the metal include 200 Altman 575W Weather PARs, using amber, blue and white dichroic filters, controlled by an ETC Unison System.

The stage lighting includes two complementary downlight systems. The first is comprised of 100 ETC Source 4 PAR MCM units, outfitted with conversion

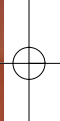
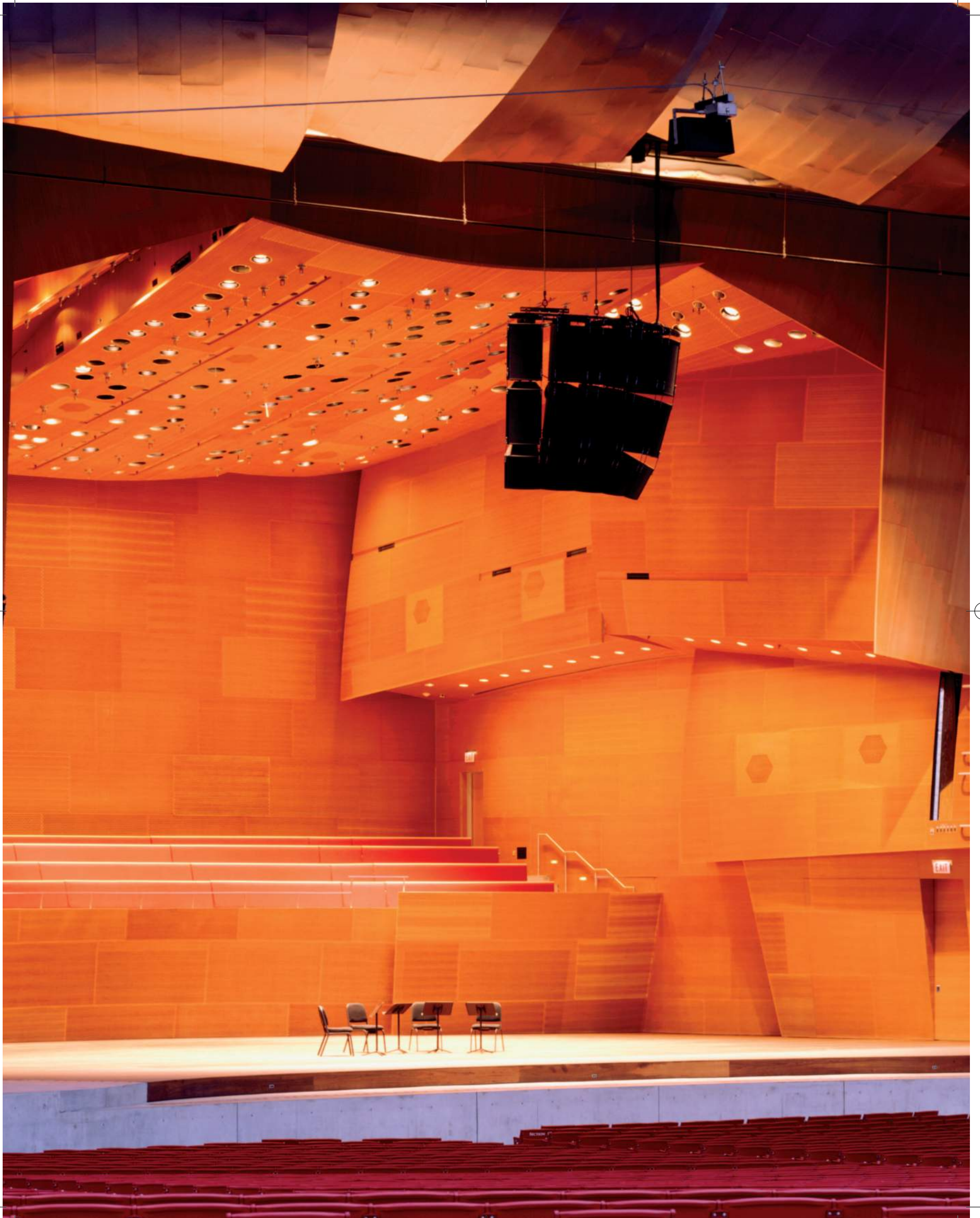
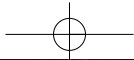


**Above:** With Anish Kapoor's "Cloud Gate" sculpture in the foreground and Lake Michigan in the background, Millennium Park occupies 24 acres of prime park land along Chicago's lakefront (Photo) Rick Talaska

**Right:** The stage accommodates a full symphony orchestra on orchestra risers, plus a chorus in the rear

(Photo) Scott McDonald, Hedrich Blessing







**Above:** The pavilion is used mainly for symphony orchestra and choral performances [Photo] Rick Talaske

kits to 150W 3000K ceramic metal halide lamps. This system has the advantage of low heat and high output, as well as energy savings. The second system uses 100 of the same fixture type, but with 575W halogen sources. The incandescent fixtures can be included at a low level to adjust the color temperature, and also to cover the re-strike time of the metal halide fixtures in the event of a momentary power interruption. They are distributed in the stage ceiling in an irregular, random pattern, as part of Gehry Partners' room design.

The house equipment includes a Unison dimming and control system for the permanently installed stage lighting, 48 Source 4 ellipsoidals, 2 Lycian 1275 1.2kW Xenon followspots and an ETC Insight 3 control console. A full Cat 5 network includes fiber optics to the house control mix area.

To integrate seamlessly into the architecture, all electrical and control plugging panels visible to the public are made of stainless steel, while those backstage are the traditional black finish.

To facilitate touring productions, there are 196 circuits drawn back to an inlet plugging panel in the dimmer room. Company switches are distributed around the venue, including two 400A in the dimmer room, one 400A and one 200A at the stage level, two 100A in the catwalks and two 200A in the house mix area. Also, there is full electrical access throughout the facility via wall and floor cable pass-throughs, with cable-mounting hooks to allow power distribution where it might be needed. Informed by the designers' personal experiences with theatre production, the pass-through system adds complete flexibility for accommodating electrical requirements of incoming productions.

### Tour de force

The rigging system also supports touring. At the stage ceiling, there are 70 dedicated Crosby rigging rings, each with 2,000lb capacity. Just downstage of the proscenium but upstage of the main speaker cluster, a "banner pipe" lineset with a 1,200lb capacity lineshaft winch allows promoters or corporate sponsors to hang advertising banners. It could also be used to mount a false proscenium.

## Delayed reinforcement speakers provide the perception that the sound is coming from the stage itself

One-ton chain motors with control are used for speaker and temporary truss hosting. The venue also has 60ft of aluminum truss and one framed projection screen with a 22ft by 33ft image size. A piano lift can be used to bring equipment up to the top orchestra riser level.

Finally, a system of acoustical curtain sets are installed in storage pockets integrated into the shell architecture. With motorized control from the stage manager's position, these drapes can be used to coat the walls for certain types of productions. They are sewn from Trevira polyester velour, a

flame-retardant material that keeps them from changing weight when humidity changes.

When Millennium Park was initially conceived, there was to be a second rehearsal/performance space directly north of the Pritzker Pavilion. The Harris Theater for Music and Dance unexpectedly moved to this adjacent site and opened nine months ago. As the theatre planning consultants for the Harris, Schuler Shook seized the opportunity to share common infrastructure where possible.

The two facilities share dressing rooms, lounges and backstage spaces, including load-in areas, freight elevators and staging areas. Using a dedicated bus-way beneath the park, just upstage right of the Pritzker Pavilion, provisions were made to locate broadcast trucks within audio snake range of both theatres.

In late July last year, an estimated 75,000 people flooded Millennium Park for a three-day celebration. A capacity crowd gathered at Pritzker Pavilion for the inaugural performance on 18 July, a world-premiere concert by the Grand Park Orchestra and Chorus. The celebration of this new cultural center began with *The Star-Spangled Banner* and ended with overwhelming praise from architectural critics and the public alike. Judging from the ongoing press and high attendance at the park since the opening, the party is far from over. Chicago's downtown is enlarged, enlivened and excited by Millennium Park. ■

*Robert Shook, ASTC, is a founding partner in the Chicago office of Schuler Shook. Todd Hensley, ASTC, is a Schuler Shook partner and project manager for the Pritzker Pavilion*

# Lighting & Sound America

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## *Dreamgirls*

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Lincoln Center's  
David H. Koch Theatre

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NAMM Report





# A HOME FOR BALLET AND OPERA

The David H. Koch Theatre has been refurbished to benefit both of its key tenants

By: David Barbour

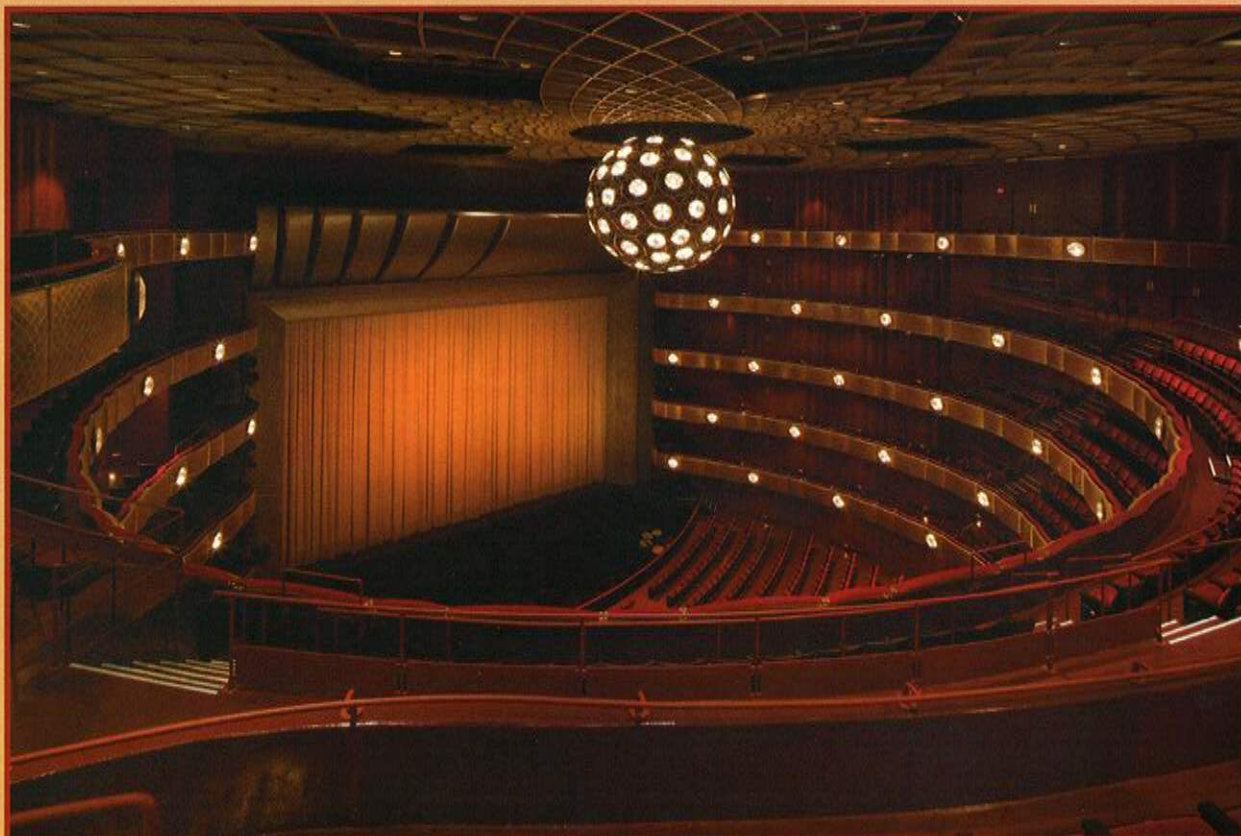
**T**he renovation of Lincoln Center continues apace. In November, we looked at the dramatic new version of Alice Tully Hall. As this is being written, the outdoor plaza is being reworked—with a new entryway, fountain, signage, and green space, in addition to a new restaurant. Last month, Lincoln Center Theatre announced plans for LCT3, a space for new plays, which will fit on top of the company's Eero Saarinen-designed home.

And then there's the David H. Koch Theatre. Formerly known as the New

York State Theatre, it has, for four decades, been the mutual home of New York City Ballet (NYCB) and New York City Opera (NYCO). (It has also hosted many visiting companies, and, in the 1960s, was the residence of Music Theatre of Lincoln Center, run by Richard Rodgers.) A big, modernist building designed by Philip Johnson, it has been in constant use for nearly half a century, providing a showplace for some of the greatest artists of the day—a list that, for openers, includes George Balanchine, Jerome Robbins, and Beverly Sills.)

And yet, as the 20th century gave way to the 21st, the State Theatre's future became clouded.

Although shared by both NYCO and NYCB, the auditorium was optimized for the latter. Complaints about the room's acoustics had been expressed for decades; in 1999, NYCO installed the Acoustic Control System (ACS), designed to give a slight lift to the acoustics. The system's most substantial achievement was to create a whirl of media controversy about the propriety of electronic enhancement



Opposite: The expanded orchestra pit. Above: The view from the fifth ring.

All photos: Ezra Kautman





The new seats, made of red mohair, were supplied by Ducharme.

for opera. When, after the events of 9/11, a new performing arts center was proposed for the site of the former World Trade Center, NYCO expressed interest in moving there. Later, there was talk of building a dedicated opera house on the footprint of Damrosch Park, just south of the Metropolitan Opera House; other possible venues were proposed as well. All of this left open the question of what would fill the State Theatre during the months when NYCB was not in residence.

At the same time, NYCO underwent a period of fundamental changes, as Paul Kellogg, the general director, was replaced by Gerard Mortier and, later, George Steel, the current artistic director. During Mortier's brief tenure, NYCO made a renewed commitment to the State Theatre, contingent on certain changes being implemented. After nearly half a century, the building was more than ready for a technical upgrade and a bit of a facelift, so NYCO and NYCB joined forces on the \$107-million project. The lead gift, in

the amount of \$100 million, was donated by David H. Koch, executive vice president of Koch Industries and a noted philanthropist in the worlds of museums, medical research, and politics. (The gift, made at a time of belt-tightening among recession-strapped not-for-profits, was an astonishing and welcome vote of confidence for both the opera and the ballet.)

The task of renovating the New York State Theatre into the David H. Koch Theatre was a delicate one for the architect, JCJ Architecture; theatre consultant, Schuler Shook; and acoustician, JaffeHolden. The building might get mixed reviews from opera fans, but it remains an icon of mid-20th-century New York; substantial changes would be made at one's peril. At the same time, the team had to move quickly, fitting its work in and around NYCB's schedule. (The opera decamped for a season of concert performances in other venues.) Overall, the challenge was to bring the theatre into the 21st century without fundamentally altering it. The

challenge has been met, resulting in a venue that is now more utile—and sparkling—than it has been for years.

**The process**

The renovation unfolded in two parts. In 2007, Schuler Shook produced a conceptual study, considering possible options for renovating the space. The study, an intensive project that required the synthesis of an enormous amount of information, was completed in only nine weeks, allowing for the clients to sign off on a plan in January 2008. (JCJ, Schuler Shook, and JaffeHolden were essentially responsible to City Center for Music and Drama, the organization that operates the theatre—but, of course, they were hired to meet the needs of NYCB and NYCO, the principal tenants.)

The primary recommendations of the conceptual study were to enlarge and mechanize the orchestra pit (which required the floor of the pit to be lowered from its previous level); replace the 1964-vintage stage lighting system and create new lighting positions on the balcony rings; install a video capture system to allow rehearsals and performances to be easily recorded; replace the fire curtain and audience seating; create new internal aisles in the orchestra seating section; enhance and upgrade the architectural finishes in front-of-house areas; and renovate the dressing rooms and wardrobe support spaces.

The team, led by JCJ, assembled the first bid package in April 2008. This included the demolition and construction work for the orchestra pit and its mechanism, electrical and HVAC systems for the pit, and electrical feeds for the new dimming system, plus the creation of a new dimmer room. A second package, issued in June, dealt with the new seating, stage lighting, and stage rigging. This was begun in August; work sessions were fitted around

existing performance schedules. Additional bid packages dealt with front-of-house and back-of-house renovations. Work was completed in 24 months, a remarkable amount of time in any case, but especially since the house continued to function during NYCB's season.

### Public spaces

Stewart Jones, a former principal at JCJ, notes that a series of subtle transformations have been made to the building, beginning with the lobbies and other public amenities. For example, the inner lobbies, which serve as walkways leading from the promenade gallery—a vaulting open space located on the mezzanine level—has been rethought with an eye towards making them warmer and appealing. These areas have been recarpeted; the material, which features a pattern that alludes to the auditorium's ceiling, is red, “a youthful, more vibrant color,” than the previous burgundy, he says. In addition, the walls are covered with a linen material containing gold threads—another reference to the auditorium. The addition of these, along with new ceilings and new lighting, “lend a more distinguished quality” to the space, Jones adds.

The bathrooms have also been renovated; Jones says his team upped their fixture count and made them ADA-accessible. The bathroom walls are now covered with an Italian tile, which alludes to the travertine marble used on the exteriors of all the buildings at Lincoln Center. The tiles contain flecks of gold, providing a link to the inner lobby walls, and, by extension, to the auditorium. The bathroom counters are made of French marble. In addition, says Jones, “We cleaned up all the public areas. We removed all the old “no smoking” signs. On the promenade levels, all the surfaces have been repainted and relit.”

Also, new video monitors have

been hung on each ring of the promenade gallery; these can be used as live video feeds for latecomers, intermission videos providing information about future performances, and donor thank-yous. (In other developments, the box office has also been refreshed with a new façade, designed by Diller Scofidio + Renfro, incorporating images of opera and ballet; the same firm also added a wing-like canopy, leading pedestrians from the street to the theatre's door.) All of these changes might not be instantly noticeable, but they combine to give these areas a refreshed look that helps create an aura of hospitality and comfort.

### An auditorium for all

Inside the auditorium, many changes have been wrought—some of them obvious, many of them not. The three most noticeable innovations are the new seating arrangement, the revised acoustics, and the enlarged orchestra pit.

Indeed, many attendees at both the ballet and opera are likely to applaud the decision to jettison the continental seating plan, which forced anyone sitting in the middle of the orchestra to traverse half the room, stepping over dozens of others, in order to reach his or her destination. (The seating plan's 40" of legroom added a modicum of comfort to the journey while doing nothing to shorten it.) The seating has been reworked into three sections with two inner aisles, as is the norm in most modern theatres. (Continental seating had its heyday in the '60s and '70s.) The new seats, supplied by the Montreal-based firm Ducharme, are made of red mohair, with wood backing and seat pans; they are slightly wider than their predecessors. In the future, a seatback tilting system may be installed. The new plan meant the loss of about 150 seats, reducing the total number to 2,586; however, the substantial legroom remains, making

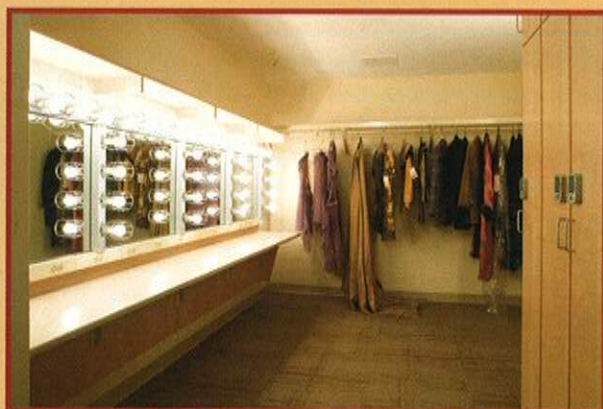
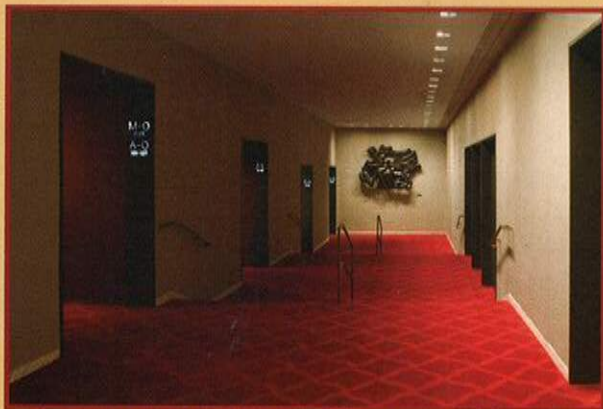
the Koch Theatre possibly the most comfortable place in New York to see a show.

Jones points out that he and his colleagues followed the principles of green design on the project whenever possible. For example, the mohair in the seats is a natural fabric; also, Ducharme was chosen in part because the team opted to work, when possible, with suppliers who were located no more than 500 miles away from New York, thus cutting down on carbon emissions.

The expansion of the orchestra pit was near the top of the opera's to-do list; the ability to accommodate orchestras of various sizes is the key to the company's artistic mission. “It was crowded when they had 60 musicians in the old pit,” says Robert Shook, principal in charge from Schuler Shook. “An average opera orchestra is about 60-65 musicians, and, when you get to Strauss and Wagner, the number can go to 110. They wanted the ability to cover the full range of the repertory.” (A key part of NYCO's artistic identity is its willingness to take on all comers, from the most obscure Handel opus to unconventional modern works. The company maintains all sorts of rarities in its repertory.)

The pit was expanded to the point that the orchestra can now be entirely accommodated in front of the stage apron overhang, a change that has beneficial acoustical implications. The expansion of the pit has been accomplished by the installation, by I. Weiss, of a new pit lift system, manufactured by Serapid. It consists of three lifts, all of them variable-speed units, which can move up to 20' per minute, lifting 95,000lbs. With the addition of the lifts, the orchestra can be placed at various heights and depths—even at stage level—meaning that, for the first time, the room can be used for concerts.

The expansion of the pit meant lowering the ceiling of the orchestra



Above left: The inner lobbies have been refreshed with new carpeting and wallpaper. Above right: The dressing rooms feature new amenities, including plenty of power receptacles.

rehearsal room located directly underneath; with the new fire curtain providing an acoustical buffer, it is now possible for the orchestra to rehearse in the pit while other work takes place on the stage. Also, in order to improve the air circulation in the pit, Schuler Shook came up with an air return scheme using thousands of small holes in the pit lift platforms, as well as sheet metal plenums that attach to the bottoms of the lift platforms and are fed by flexible ducting. "We've taken a similar approach at other venues, such as the McCaw Hall [home of the Seattle Opera]," says Shook. This aspect of the project required intensive collaboration between Shook, the JCJ team, JaffeHolden, and Serapid to coordinate the lift mechanism, plenums, and cabling and wiring for power, stage lighting, AV, and control.

In addition, the entrances to the pits have been changed. "They were located along the upstage wall," says Shook. "But the entrance was on another level, and you walked upstairs to get into it. These old doors have been retained for bringing in instruments, but now the musicians enter from down right and down left of the pit. It makes for a more efficient seating plan." Christopher Sprague, the project manager for Schuler Shook, adds, "It also allowed us to create sound and light locks for the pit, with two-door vestibules."

### Adding reverberation to the room

Of course, the room's acoustics provided a major challenge. Mark Holden, of JaffeHolden, notes that, during Gerard Mortier's tenure, Muller-BBM, a German firm, had been brought in by NYCO. When Mortier departed, the ballet, the opera, and City Center for Music and Drama chose to follow through with an American acoustician; JaffeHolden got the job.

Holden notes that the first challenge was sorting out, and trying to balance, the clients' conflicting needs. "City Center for Music and Drama wanted to have the minimum number of necessary changes made, so the project would be affordable and completed in the time frame. The ballet didn't want the sound of dancers to be more audible than it was; they really wanted no acoustical changes made to the room. The opera has always felt that the room lacked something. They had tried to use the electronic enhancement system to make the room brighter and more resonant—but George Steel wanted a natural acoustic solution. It was one of the most complex, difficult, and interesting challenges that we've taken on."

First off, Holden says, "We thoroughly documented the room's acoustics, including the stage and the pit, which hadn't been done. We also

researched the history of the room—what had been changed, added, and subtracted. We made the measurements even as changes were being made; for example, we were asked to approve the seats that Muller had approved. In that case, we had them modified to become more sound-reflective. It was a daily challenge."

The acoustical measurements proved to be revealing. Holden notes that, when NYCB plays other venues, the dancers complain that their footwork is more audible. "That was always George Balanchine's desire—that when the ballerinas are *en pointe* and moving *en masse* across the stage, they should be very quiet," he says. "We did research into toe shoes—the sound they make on the stage—as well as how the stage was built, the reflection patterns on the walls, and the reverberation in the house. We also did some acoustic modeling and found some interesting things going on."

Among the revelations: "The construction of the stage floor is unique; it's got a surface that absorbs the impact of the toe shoes, rather than resonating like a drum head. It's really the only one of its kind that we know of." Also, Holden says, "Because of their concave shape, the audience side walls were not reinforcing the sound of the shoes in any substantial way—of course, they also weren't reinforcing the

singers." The problem, he adds, was this: "If we made the walls more supportive, would we be reinforcing the sounds the ballet didn't want?"

To solve this conundrum, Holden says, "We came up with a scheme of flexible sound-absorbing panels mounted to new walls; it can be used by the ballet but they can be removed for opera performances, allowing the room to become brighter and more resonant." The new side walls, which are made of a heavy plaster, start at the proscenium wall and reach about 25' into the auditorium; they are found on all levels, from the orchestra to the fifth ring. At the same time, the room's extensive carpeting, which covered the aisles and the rear walls, was also removed: "Pulling all of it down off the walls and revealing the concrete floors also contributed to making it a brighter-sounding room."

As opposed to the above changes, which required intensive discussion with both NYCB and NYCO, Holden says, "The pit was an area that both the opera and ballet wanted improved. Everyone wanted a louder sound, with more brightness and clarity." He adds that the pit's wooden floor was designed to improve the response for string basses and cellos. The design of the floor was done in conjunction with Schuler Shook and JCJ to accommodate the air-ventilation system described above. In addition, the pit rail, supplied by Steeldeck Staging, contains panels

that allow the sound from the pit to either be transmitted or to reflect back to the stage, functioning almost as a set of stage monitors.

All of these changes—the reshaping of the side walls, the enlarged orchestra pit, the new seating, and the new acoustical panel system—combine to give the theatre a kind of flexibility it has never had before.

### The technical upgrade

Many other improvements were made as well. Lighting designers working at the Koch Theatre will now have many more positions to choose from, thanks to additions on the second, third, fourth, and fifth rings. (The first and third rings have been outfitted with new camera positions.) "One of the biggest challenges was preserving the look of the building," says Shook. "They never had balcony rails, which made conditions very difficult for lighting designers." The issue, of course, was simple: Nobody wanted to see intrusive pipes loaded with lighting instruments. Therefore, he adds, "We put them on the sides of each ring, on the underside of each balcony."

For onstage lighting, I. Weiss installed five motorized light ladders per side, mounted with trolleys to 11'-long I-beam sections for lateral movement up and down stage. Each I-beam is, in turn, motorized, with a dual drum line shaft for vertical movement. The line shafts are mounted on 2' custom steel

stanchions for greater access to the grid. Each ladder measures 3'6" wide by 18' high and has a 1,200lb capacity. I. Weiss also added an additional variable-speed lineset with a total travel of 84', achieved by a line shaft system with seven cable drums.

The lighting package for the theatre, supplied through Barbizon Lighting, includes fifty 14° ETC Source Fours, along with two ETC Eos console (one for backup) and an ETC Ion located backstage, to be used during focus calls and changeovers. In addition, City Theatrical, working with NYCB and NYCO, created a set of custom-made cyc lights. "The old system used pear-shaped lamps, and they wanted to replicate the light output from those with new technology," says Sprague. "We also replaced the footlights—a set of old Kleigl units that had been put into the concrete and wired into place—with new L&E mini-strips." (The old, bowed stage apron has been replaced to accommodate the modular footlight trough.)

The control booth, located in the back of the auditorium, was renovated, with new counters, cabinets, and casework added. "We worked with Iris Novick, the main board operator on the setup of the room," says Shook. "Control rooms have a way of taking on the personalities of the operator or the equipment, or both. The new layout is tied to how Iris and the other electricians work."



Above left: The control booth has been upgraded. Above right: The new video capture suite, located under the orchestra seating.

In addition, Schuler Shook replaced the original patch-panel system for a new setup consisting of 1,828 circuits, including dimmed 20 and 50A circuits and switched 120 and 208V and 20 and 50A circuits. An extensive ETC Net3 network provides new flexibility. "Originally," says Shook, "they had about 100 dimmers, and, with the addition of portable dimmer packs, the count was something like 500; that number included switched circuits for projectors and moving lights. This has become a big issue for opera houses and ballet companies—they now use moving lights, and not all of their circuits can handle them. We've added a much larger quantity of switched circuits around the house, with different voltages and amperages. This was done following weeks of discussion about every possible position and how many types of circuits. Christopher Sprague created a matrix that showed every circuit in every position."

Sprague adds that there are two full control networks, plus a lifeline from the control room to the dimmers. "The main Eos console is run on the common network; the backup network exists to keep the show up and running, addressing the dimmers directly in case something happens. There's also a third network, which is dedicated to projection; there are ten different locations where the projection system can tie in. The house lights and relay circuits can be accessed through the Eos or an AMX interface."

The electrical feeds to the new dimmer room consist of twenty 4" conduits wending their way from the main electrical room, located two levels below stage, to the new dimming room in the building's attic. Over a mile's worth of 4" conduit was snaked through corridors and rehearsal, dressing, and mechanical rooms; the installation process took six months.

The stage rigging system was largely left intact, with 99 linesets on

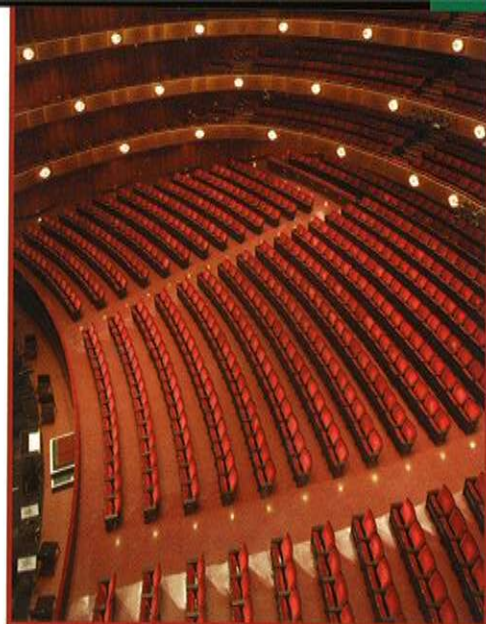
4.5" centers, except for the addition of one new motorized lineset located downstage of the cyc bridge.

"Depending on how the bridge is being used, it gives them a lot more flexibility," says Shook.

Another kind of flexibility is provided by the new I. Weiss-installed fire curtain; as mentioned, it has acoustical properties, acting as a reflective orchestra performance shell and a soundproof divider between the orchestra pit and stage, allowing for two separate rehearsal activities to take place simultaneously. The curtain is a 66'-wide-by-43'-high steel frame with a painted 18-gauge sheet metal face, two different interior acoustic barriers, and a Zetex backing. It weighs 23,000lbs and is operated by a 2,300lb winch engineered and fabricated by JR Clancy. It has dual hydraulic descent controls; the custom arbor is 30' and contains 290 counterweight bricks weighing 73lbs. each. With the curtain in place, and the pit lift raised to the stage level, it is now possible to hold a music recital in the auditorium.

The dressing rooms were given a significant upgrade, a change that, Shook says, will definitely benefit the members of the ballet company. "We discovered that when the ballet moves in, the dancers basically live in those rooms for the duration of the season, so we had to be a little more careful and accommodating for them. Typically, a dressing room in a theatre is a bare-bones place, but these were more carefully considered." For example, the two-person and chorus dressing rooms have been fitted out with plenty of power receptacles; in the past, the performers had to make do with extension cords. In addition, the opera's wardrobe storage room has gained four new fitting rooms, humidity control, and new lighting with UV filters.

The final new amenity is the addition of a media suite, located one floor below the orchestra seats. A



The new seating layout adds two aisles.

video capture system has been installed to record rehearsals and performances. It includes several permanently mounted automated cameras, controlled by operators stationed in the media suite.

Other key players in the renovation of the theatre were DeSimone (structural engineer), Pennoni (mechanical/electrical/plumbing engineer), TV Magic (video gear consultant), RC Dolner (general contractor), Polo Electric (electrical contractor, stage lighting, media AV system, rigging system), and Commercial Electric (electrical contractor, orchestra pit lifts, stage lighting feeds, front of house).

## Facing the public

The David H. Koch Theatre opened with a gala evening on November 5, followed by NYCO's fall season, which kicked off with productions of *Don Giovanni* and Hugo Weisgall's *Esther*. The initial word has been promising. "The natural, unamplified voice has a new showcase at the refurbished David H. Koch Theatre," said *The New York Times*. At the same time, NYCB has been able to go on as before, without any complaints about added noise.

In the end, the project has seemingly benefitted both companies. Having sailed through its renovation, the David H. Koch Theatre is poised to enter a new and better era. 📶

# Auditoria



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# Ontario on song

The Four Seasons Opera House comes to Toronto



# Lobby life

By balancing design and function the lobby creates a venue's first impression

Robert Shook, Schuler Shook, USA

The Palais Garnier, Paris



If it does nothing else, a theatre lobby must provide a sense of arrival. And comfort. Oh, and expectation. Oh, yes, and also community. We ask a lot of our lobbies, so it is not surprising that some get it right and some fall short. What are the elements of a successful lobby? What do modern audiences expect from a lobby? And what will the audience of the future expect? It might help to think about the many different roles that a lobby is asked to play in the course of a performance evening.

### The pre-show lobby

For many theatres, the lobby is a glowing lantern that emanates excitement, that broadcasts to the passing public that something very interesting is happening here. In the right location, and in conjunction with a sparkling marquee, a lobby filled with animated theatre-goers can do more to sell tickets than many forms of advertising. This effect is not difficult to achieve; the primary ingredients are large windows and light-colored walls brightly lit.

Before the performance, the lobby is the public point of arrival, so attention must be paid to the arrival sequence and satisfying the initial way-finding requirements of the public. Foremost in the minds of most audience members are questions like, "Where do I get my tickets?", "Where are the restrooms?", and "How do I get to the balcony?" Understandably, architects are often loath to introduce signboards into the carefully calculated arrival sequence, so the successful theatre planner will locate key elements in logical locations and allow the audience to find their way with a limited amount of frustrating exploration.

The box office is often most successfully placed nearest the primary public entry, since it is visited during the day when the main part of the lobby may not be open to the public. (This 'primary public entry' is often difficult to identify, since many theatres have a pedestrian entry and a parking entry, often on separate levels – another knotty challenge to solve!) Modern box office design is evolving as well; in order to feel welcoming and accommodating, many box offices are doing away with the traditional bullet-proof glass 'wickets' in favour of open counters similar to hotel registration desks. Because cash is less frequently used for ticket purchases, the

The successful theatre planner will locate key elements in logical locations and allow the audience to find their way

security of bullet-proof glass is not required for some theatres.

Many theatre architects are only too happy to point the way to the balcony by creating architecturally significant grand staircases in the most prominent locations. Following in the footsteps (so to speak) of Charles Garnier, who designed the ultimate monumental staircase for the Paris Opera House, theatre architects can provide a point of pride, orientation, and architectural grandeur with a well-designed monumental stair. Whether straight or curved, steel or wood, carpet or concrete, a truly successful monumental stair should transcend its basic purpose as a means of ascending and descending – and pausing to be noticed – to represent the single most galvanizing architectural statement in the (hopefully) already spectacular lobby.

### The intermission lobby

Intermission puts the greatest occupancy load on a lobby, so it is under these conditions that the architectural program for a lobby is calculated. There are no quick and easy answers to the question, "How big should the lobby be?" We are all familiar with lobbies in most Broadway theatres, which practically require the audience to either stay at their seats or spill out onto a crowded sidewalk. However, modern audiences attending new or renovated theatres are understandably less willing to withstand the crunch at intermission. For this reason, experienced theatre planners will recommend a minimum of eight square feet of lobby per audience seat for 'milling space', plus an additional five to six square feet per seat for circulation – i.e., space for the audience to get to and from restrooms and concession stands. The amount of milling space can run as high as 15 or 20ft<sup>2</sup> per seat for concert halls and opera houses requiring a sense of opulence.

Planning the public restrooms is an art in itself. To begin with, most theatre planners recommend that there be restrooms on every seating level, and that the distribution of restroom fixtures (euphemistically called 'elimination fixtures' in the building codes) be proportional to the distribution of audience seats. Experienced theatre planners also understand that most building codes do not fully recognise the load that a 15-minute intermission puts on public restrooms; theatre planners have their own criteria, gained from years of experience, on how many fixtures are required to assure that the lines do not get dauntingly long during intermissions. The correct quantity of fixtures is usually more than double the number required by building codes, particularly for women's restrooms, since women statistically make up a higher percentage of a typical theatre audience, in addition to requiring more time in the restroom. Many US cities have recently adopted new building code provisions that require more women's fixtures for public assembly spaces.



Lobbies at intermission are usually noisy places. Most lobbies have a limited amount of acoustically absorbent materials – generally limited to carpeting – so the decibels can accumulate quickly. Noise in a lobby is most often generally viewed as a positive attribute, a condition that reflects the excitement of the event. However, too much noise can make casual conversation difficult, and it can also make it almost impossible to signal the audience back to their seats by auditory means, such as chimes. As jarring as it is to flash lights on and off, in many lobbies it is the only way to gain the audience's attention.

### The special event lobby

With increasing frequency, lobbies in US theatres are being put to work as stand-alone venues for fund-raising dinners, wedding receptions, small trade shows, and even music performances. Many performing arts centres are dark on one or two evenings each week, so it is tempting to capitalise

Before curtain time, displays can show videos of past productions or other materials intended to help immerse audience members in the world of the performance

on that dark time by renting the lobby for such events, allowing the total facility to be more fully utilised and assisting the bottom line. It is very common to plan a catering kitchen that is both adjacent to the lobby and accessible to a loading dock. Theatre planners are also providing lots of power points scattered throughout the lobby and 'company switches' for powering small lighting and audio systems.

Several years ago, the Denver Center for the Performing Arts actually built a special event space – the Seawell Grand Ballroom – to meet the growing demand for special events. Renting spaces for special events can be one profitable enterprise run by an otherwise non-profit entity. As many lobbies are 'lanterns' after dark, these special events can communicate the vitality of the institution on evenings that would otherwise be dark.

### The amenities

The well-appointed lobby has many elements, not the least of which are facilities for concession sales. When planning new facilities, many theatre operators are reluctant to provide fixed locations for built-in concession stands. This is partially due to over-reliance on the

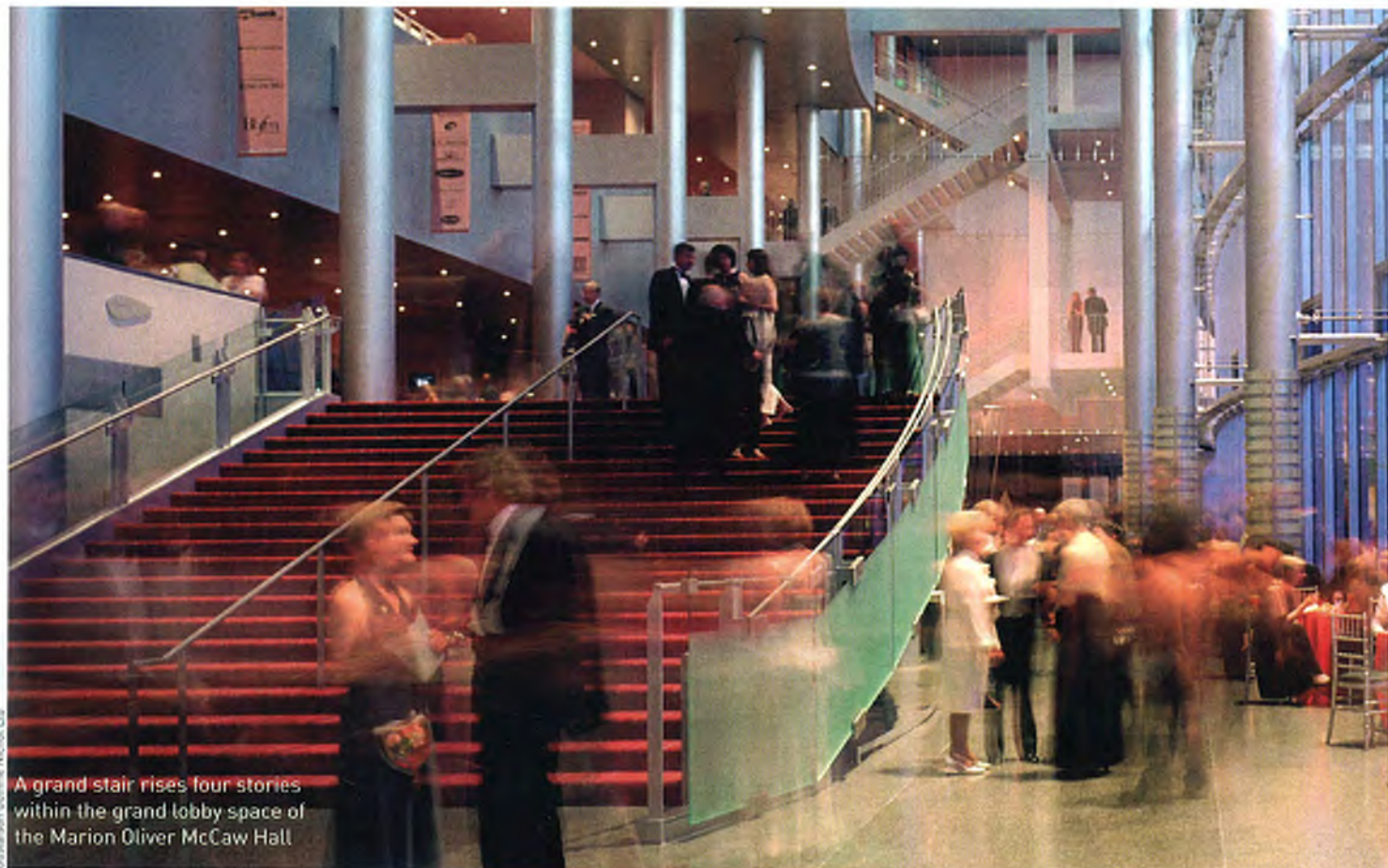


At Chicago's Lookingglass Theatre, several large monitors display images of members of the acting ensemble floating through water, a direct connection to their location in *The Waterworks*, part of a city water pumping station

past practice of erecting portable stands scattered about the lobby, and partially due to operators' understandable reluctance to 'nail down' the concessions locations out of fear of putting them in the wrong place. When Chicago's Goodman Theatre opened new facilities in 2000, they dispensed

concessions from portable stands. After three years, they had enough experience with their patrons' use of the lobby to know where to build permanent concessions locations.

Many US theatres have recently begun experimenting with food sales prior to



A grand stair rises four stories within the grand lobby space of the Marion Oliver McCaw Hall

performances. Particularly in locations where patrons might travel directly from work to a performance, audiences welcome the opportunity to purchase a sandwich in the lobby. Retail sales are also increasing at most US theatres – typically the traditional t-shirts, caps, coffee mugs, CDs, and play scripts – so the right location must be identified for this profitable activity as well.

Video displays are proliferating in our lobbies, just as they are in almost all public spaces today. Many theatres locate video monitors just outside of some of the auditorium entries so that late-arriving audience members can watch the performance while waiting for an opportune moment to rush to their seats and mumble their embarrassed regrets. Before curtain time, they can display videos of past productions or other materials intended to help immerse audience members in the world of the performance. At Chicago's Lookingglass Theatre, several large monitors display images of members of the acting ensemble floating through water, a direct connection to their location in *The Waterworks*, part of a city water pumping station.

### The lobby of the future

At a recent congress of the International Society for the Performing Arts, one fascinating seminar explored ways in which theatre operators can successfully bridge the technology and culture gaps between today's audience and tomorrow's audience. At this seminar, Diane Ragsdale,

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senior program associate for the Performing Arts Program at the Andrew W. Mellon Foundation, noted that young patrons may be most drawn to 'centres' where many different activities can be sampled over the course of a six- to seven-hour stay. She went on to recommend that lobbies provide "gathering spaces for small groups to interact" and that lobbies be spaces that "activate people to want to gather".

Is tomorrow's lobby beginning to look something like a shopping mall? Will live performance theatres join their cinematic cousins and slide in over the Barnes & Noble? Will the monumental stair give way to escalators?

It seems likely that the line between commercial and non-profit will continue to blur. As it becomes more and more difficult to fundraise for standalone buildings with high construction costs, non-profit theatres are looking to marriages with commercial entities in order to find new and upgraded facilities. In Chicago, the fast-emerging Chicago Shakespeare Theatre recently

constructed a new theatre facility above an ice cream shop, a mirror funhouse, and a 3D thrill ride on Navy Pier, also home to a food court, dozens of trinket shops, an IMAX theatre, and a Ferris wheel. After four years of operation in this new location, Chicago Shakespeare has been so successful that it has nearly outgrown its seating capacity and is already considering expansion into another area of Navy Pier.

Another aspect of theatre planning – and lobby planning in particular – that we must not fail to acknowledge is audience security. Many Broadway theatres have some form of security screening in place, and because these theatres are not designed with this in mind, it is not unusual to see long lines of theatre-goers waiting on the pavement outside to enter through a single door where bags are being searched. We are probably just one unfortunate tragedy away from metal detectors at all theatre entries.

Theatre planners must constantly look forward, to recognise these and other trends in our culture and our future audience that will shape theatre buildings in the immediate and distant future. All buildings learn to adapt, and in many of our older performance buildings today those adaptations show a bit too obviously. As we acknowledge the potential for future changes in our patrons' culture, we assure theatre companies that their facilities – especially the lobbies – will interest and attract large audiences well into the next century. ■