

# the **ASTC** letter

The Newsletter of the AMERICAN SOCIETY OF THEATRE CONSULTANTS

## THE “GREEN” DESIGN OF PERFORMING ARTS BUILDINGS

Architects and clients may assume that energy efficient “green” strategies and performing arts buildings are mutually exclusive, but this does not have to be the case. Many of the established criteria for green building design apply quite readily to performing arts venues. Effective “green” design is simply smart and efficient design that takes into consideration proper urban planning, re-use of materials, conservation of energy and natural resources, and effective operation of the building. ASTC theatre consultants are increasingly called upon to work within building design teams to promote and achieve optimum levels of “green” design in performing arts building projects.

The US Green Building Council has developed its LEED (Leadership in Energy and Environmental Design) rating system to establish what makes a building “green”. Many clients and municipalities are actively encouraging projects to achieve a LEED rating. Some cities are rewarding “green” initiatives with financial incentives such as tax reductions or

additional project funding. The LEED certification uses a point system in which every “green” advancement wins a point toward a total rating ranging from a base level of Certified to higher qualifications of Silver, Gold and Platinum.

The following is a description of some of the areas where “green” design can be achieved in performing arts building design projects.

Site selection: The choice of urban locations that do not threaten green space and the use of alternative transportation sources (public transit, bicycles and alternative vehicles) are fundamental issues pertinent to effective green design. Performing arts centers are often located in a town center near existing utility services, public transportation and parking.

Building envelope, mass, and exterior: Water management, roof heat control, material selection and orientation in respect to sunlight are primary LEED issues. The long-span roofs of theatres and stagehouses can provide catchments for

waste-water management and may be considered for green roof installations. The large walls and high roofs may provide opportunities for power using solar panels or wind generation. Depending on solar advantages and disadvantages, glass-front public lobbies can be oriented in directions to maximize energy efficiency.

Building operations: Heat and cooling efficiency, reductions in the use of water, and effective management of wastewater all bring LEED points. Under-floor HVAC supply “displacement” systems are a natural fit for LEED credit; their efficiency greatly exceeds that of ceiling supply systems. These systems fit well into audience chambers, where some of the greatest heat loading is found. In stagehouse fly towers, natural venting may be considered, as well as heat collection systems to gather heat generated by stage lighting instruments. Renewable energy sources and power co-generation have LEED value.

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## “...JUST A STAGE HE’S GOING THROUGH...” A Survey on Stage Floor Design

On a recent multi-purpose theatre project, the design of the stage floor became the subject of considerable debate. The Theatre Consultant recommended stained hardwood, tongue & groove strip wood floorboards. The flooring contractor, accustomed to gymnasium floors, advocated his standard gymnasium floor product. The newly hired facility Technical Director wanted the same floor that he

had worked on at his previous theatre: “Masonite” over plywood. What’s a theatre consultant to do? He conducted a non-scientific survey of online tech riders, which confirmed that existing performance facilities typically utilize tongue & groove strip wood floorboards, usually constructed of some species of hardwood.

After a mockup and considerable

discussion, the user group (theatre, music and dance departments) elected to pursue the Technical Director’s choice, which they felt was most desirable from the perspectives of performance and cost. While this particular situation was resolved, it left the theatre consultant to wonder what his peers were recommending on their projects, so he requested some informal feedback. This survey asked specifically about the top surface; the resilient substructure is a separate topic, best left for another discussion.

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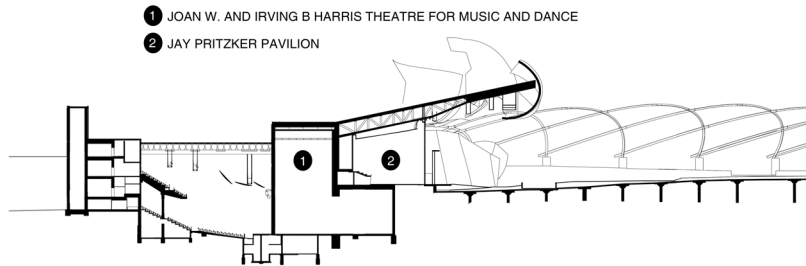
# The Theatres in Millennium Park

## Chicago, Illinois

Two new theatres reside back to back in Chicago's Millennium Park. The Harris Theatre is a 1,500 seat indoor theatre that serves as the primary performance venue for over 15 mid-sized performance companies, including Hubbard Street Dance, The Chicago Sinfonietta, and Chicago Opera Theatre.

There is a great deal of flexibility built into this theatre, including a significant adjustable acoustics system with retractable side wall banners and overhead tracked curtains, in order to provide uncompromising room acoustics for everything from Music of the Baroque to dance concerts utilizing pre-recorded amplified music tracks.

Pritzker Pavilion is an outdoor music theatre with a capacity of 11,000 – 4,000 fixed seats plus 7,000 on the lawn. It is home to the Grant Park Orchestra and Chorus, which present the only remaining free professional classical concert series in the U.S. The theatre also presents a wide array of concerts under the sponsorship of the Mayor's Office of Special



Events. Pritzker Pavilion features the only electronic acoustic enhancement system to be installed in an outdoor theatre; this system provides for the audience a highly authentic simulation of the acoustic environment of an indoor concert hall. In order to array all of the speakers required for both the audio

reinforcement system and the acoustic enhancement system, architect Frank O. Gehry designed a unique pipe trellis that spans 300 ft x 600 ft over the audience. These two theatres were completely separate developments that were wedded after the design processes for both theatres were well under way. The proximity of the two stages, together with the fact that their performance seasons overlap only slightly, provided the opportunity for them to share backstage facilities, including dressing rooms, lounges, and receiving docks.



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**Conservation of materials:** Retaining a significant portion of the building during a renovation, diverting construction materials from landfills, using locally available materials, and re-using portions of building materials are significant LEED values. These all reduce the amount of “embodied energy” – whether in extraction, manufacturing, or shipping of materials – represented in the building. Elements of stage systems – the steel in the stage rigging, the copper in the wiring, or the wood of the stage floor – may be opportunities for local sourcing. Existing structural elements may be candidates for potential re-use. Old-growth wood salvaged from the columns and beams of demolished buildings can often be used for excellent stage flooring material.

**Environmental Quality:** Establishing systems such as high Indoor Air Quality, Environmental Tobacco Smoke Control, and carbon monoxide monitoring win LEED points, as does the use of construction and finish products with low emission of Volatile Organic Compounds (VOC's).

**Daylighting:** Daylight and views for all occupants of the building are encouraged, although with performing arts buildings it must be recognized that not all spaces are appropriate for daylighting. Remember, though, that a performing arts facility will be a full-time office environment for certain staff members. Offices and shops are some of the best opportunities for windows and views.

**Innovation:** Performing arts venues provide opportunities for significant innovation in architectural and mechanical system design, and other innovative ideas for energy and environment are waiting to be developed.

ASTC theatre consultants are actively involved with projects throughout the country using a wide range of LEED-recognized approaches to achieve successful theatre renovations and new constructions. Work with your ASTC theatre consultant to apply them to your project.

Todd Hensley, ASTC  
Robert Long, ASTC

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# ASTC NEWS



## **Harris Theater for Music and Dance (above)**

Architect: Hammond Beeby Rupert Ainge  
Theatre Consultant: Schuler Shook  
Acoustics Consultant: Jaffe Holden  
Acoustics  
Completed: October 2003  
Construction Cost: \$52.7 million

## **Jay Pritzker Pavilion (left)**

Architect: Gehry Partners  
Theatre Consultant: Schuler Shook  
Acoustics Consultant: TALASKE  
Completed: July 2004  
Construction Cost: \$38 million

The American Society of Theatre Consultants was recognized by the U.S. Institute for Theatre Technology (USITT) at the annual conference in Long Beach in March, in honor of the 20<sup>th</sup> anniversary of the ASTC. The ASTC also presented a seminar on the Past, Present, and Future of Theatre Design.

The ASTC held its Annual Meeting in Dallas-Fort Worth in February. The topic was "Food, Beverage, and Marketing in the Front of House". ASTC members toured Next Stage, a new 6,000 seat theatre in Grand Prairie, and they hosted a discussion with invited guests Paul Beard, Managing Director of Bass Hall in Fort Worth, and William Eaton, President of Cini-Little, food service consultants.

ASTC's Forum 2004 was held in Denver in September. ASTC members toured a great many theatres in the Denver area, including the Denver Center for the Performing Arts, the King Center at the Auraria Higher Education Center, and the Newman Center for the Performing Arts at the University of Denver.

Benton Dellinger, Stephen Placido, and Charles Swift have been accepted as Members of the Society. Joshua Grossman was accepted as an Associate Member.

At Auerbach Pollock Friedlander, Tom Neville, ASTC, has been promoted to Principal, and Grace Gavin, ASTC, has been promoted to Senior Associate. A new book by Charles Swift, ASTC, "Introduction to Stage Lighting", has just been published by Meriwether Publishing. Joshua Dachs, ASTC, will serve on the USITT 2005 Architecture Awards jury.

Jack P. Hagler, ASTC, has been promoted to Principal at Schuler Shook. Kyle Smith, ASTC, and his wife Ann were married on October 6 in Asheville, NC. Michael Mell, ASTC, is participating in the ACE Mentoring Program, which gives inner city high school students an introduction to architecture, engineering, and the building trades.

The ASTC 2005 Annual Meeting will be held in Chicago in February, and ASTC's Forum 2005 will be held in Las Vegas and will concentrate on theatres that are built for specific productions. The ASTC is one of the Event Partners for Auditoria Expo, which will take place on April 14 and 15 in Vienna, Austria. ASTC members will present a seminar related to theatre planning as part of this significant international event.

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## *(FLOORS—Continued from page 1)*

Numerous responders indicated that drama & dance theatres are best suited to plywood or MDF substrate with some sort of tempered hardboard, such as Masonite "Duron" or linoleum covering that facilitates inexpensive routine maintenance and repeated recoloration. Many agreed that strip flooring is best suited for music venues and other facilities where the visual appearance of the flooring is important.

Some of the most surprising responses concerned the variety of desired wood species for tongue & groove strip wood flooring. Numerous responses indicated preference for softwoods including edge-grain, quarter-sawn yellow pine, although others qualified this choice saying that it is too soft for "heavy-duty" use. Typical hardwood selections in-

cluded Maple, Red Oak and White Oak.

The depth and desired orientation of strip wood floors drew responses indicating a preference for boards that are up to 33/32" (milled size of nominal 5/4" stock) to develop strength and the ability to endure multiple sandings before requiring replacement. All agreed that the boards should be oriented across stage so as not to create forced perspective and so as to minimize the rumble of castered wagons rolling on and off stage. The width of the boards was subject to differences of opinion as some advocated 2-1/2" to 3" and others felt boards up to 4" or 5" were more appropriate.

The responses concerning desired stage floor color were largely as expected. While almost everyone expressed their preference for dark hued or black stages (unless program determined other-

wise), several respondents related the difficulties of permanently staining dense hardwoods like maple. They suggested the use of aniline dye or alcohol- or oil-based penetrating stains. There was also relative consensus of opinion concerning the use of latex based paint with matte finish for floors with sheet stock finish.

Request for the identification of secrets and insights to consider brought numerous informative responses like ensuring the buy-ability and build-ability of the floor based on available wood species, geography, and the capabilities of the flooring contractor. Multi-purpose floors designed to accept lag bolts and drop cloth tacks present one set of requirements, while recital halls often require flooring that would look at home in a palace. Outdoor stages may require

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## THEATRE PROJECTS IN PROGRESS

*The following theatre and assembly projects are in various stages of design and construction in ASTC members' offices:*

### ARTEC

Barbara & David Loeb PAC, Germantown Friends School, Philadelphia, PA  
New Recital Hall, Utah State University, Logan, Utah  
National Philharmonic Hall, Budapest, Hungary

### AUERBACH · POLLOCK · FRIEDLANDER

Washington & Lee University, Art and Music Facility, Lexington, VA  
Cathedral of Christ the Light, Oakland, CA  
African American Cultural Center, Pittsburgh, PA

### CDAI

Nova Southeastern University Performing and Visual Arts Center, Fort Lauderdale, FL  
Nashville Arts Magnet School, Nashville, TN  
Greeneville H.S. Performance Hall, Greeneville, TN

### DAVIS CROSSFIELD ASSOCIATES

Performing Arts Center, University of North Carolina at Charlotte  
The Two River Theatre Company, Red Bank, New Jersey  
Prince William Performing Arts Center, Manassas, Virginia

### FISHER DACHS ASSOCIATES

Venetian Casino Theatre, Las Vegas NV  
Siam Opera Theatre, Bangkok Thailand  
RPI Experimental Media and Performing Arts Center, Troy NY

### GEORGE THOMAS HOWARD, ASTC

New Buffalo High School Auditorium, Buffalo Wyoming  
New 'K-12' School Auditorium, Kay Cee, Wyoming  
South Anchorage High School Auditorium, Anchorage, Alaska

### JONES & PHILLIPS

News-Journal Center, Daytona Beach, Florida  
Red Skelton Performing Arts Center, Vincennes, Indiana  
S.E. Belcher Jr. Chapel and Performance Center, Longview, Texas

### LANDRY & BOGAN

Portland Center Stage Armory Theater, Portland, OR  
East Los Angeles College Performing and Fine Arts Complex, Los Angeles CA  
Delores Doré Eccles Fine Arts Center, St. George, UT

### LUSTIG & ASSOCIATES

Missouri Methodist Church Columbia, Missouri

### JAY PANZER, ASTC

Palace Theatre, Columbus, OH  
Columbus Lincoln Children's Theatre, Columbus, OH

### SCHULER SHOOK

Stages St. Louis, St. Louis, MO  
Paramount Theatre, Charlottesville, VA  
Jackie Gleason Theatre, Miami, FL

### THEATRE CONSULTANTS COLLABORATIVE

Historic Asolo Theatre, Sarasota, FL  
Michael D. Palm Theatre, Telluride, CO  
Marion D. Campbell Performing Arts Center, The Groton School, Groton, MA

### THEATRE PROJECTS CONSULTANTS

Tempe Center for the Arts, Tempe, AZ  
Center for Theatre and Dance, Williams College, Williamstown, MA  
New World Symphony, Miami Beach, FL

### TSG DESIGN SOLUTIONS

Colony Theatre, Miami Beach, Florida.  
St. Andrews School, Boca Raton, Florida.  
Broward Community College, Hollywood, Florida.

### WRIGHTSON, JOHNSON, HADDON & WILLIAMS

Houston High School for the Performing and Visual Arts, Houston, TX  
Gaylord National Resort, Prince George's County, MD  
Majestic Theater Restoration, Gettysburg, PA

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anti-humidity measures to ensure adequate traction and longevity.

Several respondents bemoaned the size & geometric inconsistencies of "Plyron" (hardboard laminated to plywood) and detailed the tendency of hardboard to "go wild." They suggest the pre-drilling and countersinking of dry-wall screws as well as the avoidance of expansion joints between sheets. Furthermore, they indicated that the sanding of the sheets prior to painting diminishes the ability of the floor to hold its color under spike tape and the like.

In conclusion, it appears that, just like so many other aspects of theatre design, there is no one answer to the question of which stage floor is "right" for each venue. However, with careful consideration of the available products on the market and the design factors identified herein, stage flooring that ably meets the performance criteria of the facility can be selected.

Edward Kaye, ASTC

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