

BLACK-TIE OPTIONAL

Lighting dresses up (or down) a diverse range of venues at RPI's new performing arts center

BY ELIZABETH HALL

From tuxes and tails to T-shirts and jeans, the dress code varies on any given night at Rensselaer Polytechnic Institute (RPI)'s new Experimental Media and Performing Arts Center (EMPAC) in Troy, NY. Designed by GRIMSHAW Architects, New York, EMPAC is a 220,000-sq ft glass structure with multiple venues that cater to a broad range of performances—from opera to experimental theater. The venues include two studios, 2,500-sq ft and 3,500-sq ft respectively, a 400-person theater, and a 1,200-seat concert hall encased in a wooden hull, all equipped with the latest audio-visual and digital media systems and advanced acoustics. While the overall architectural design is industrial, the spaces vary in style from elegant and polished to rough and edgy.

Lighting follows suit. Designers Jean Sundin and Enrique Peiniger, founders and principals of Office of Visual Interaction (OVI), New York, tailored the lighting in each space to complement its “dress code,”



Photos: Paul Rivera

The formal aesthetic of the concert hall required “black-tie” lighting. In addition to illuminating the stage and seating areas, the lighting showcases acoustic elements like the textured walls and fabric ceiling, which take the place of decorative luminaires.



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says Peiniger. “Some areas are very formal, some are less formal. We treated them like brothers and sisters. They are each unique, but they have to relate to one another.”

RPI, a technological institute best known for its engineering and science disciplines, seems an unlikely home for a high-profile facility dedicated to the arts. Yet, this is precisely why the university conceived the project. RPI president Shirley Ann Jackson felt that EMPAC would pull artistic students to the campus and enhance RPI’s artistic reputation. “The institution wants to be as well known for art as they are for technology, to give students a well-rounded experience,” explains Sundin. In the process, OVI joined a team of consultants for the project, including acousticians Kirkegaard Associates, Chicago, and theater consultants Fisher Dachs Associates, New York. Sundin and Peiniger designed lighting for the entire facility, including not only the performance venues, but also the main lobby, theater lobby, office spaces and back-of-house areas.

FORMAL DRESS REQUIRED

In terms of architectural dress code, the concert

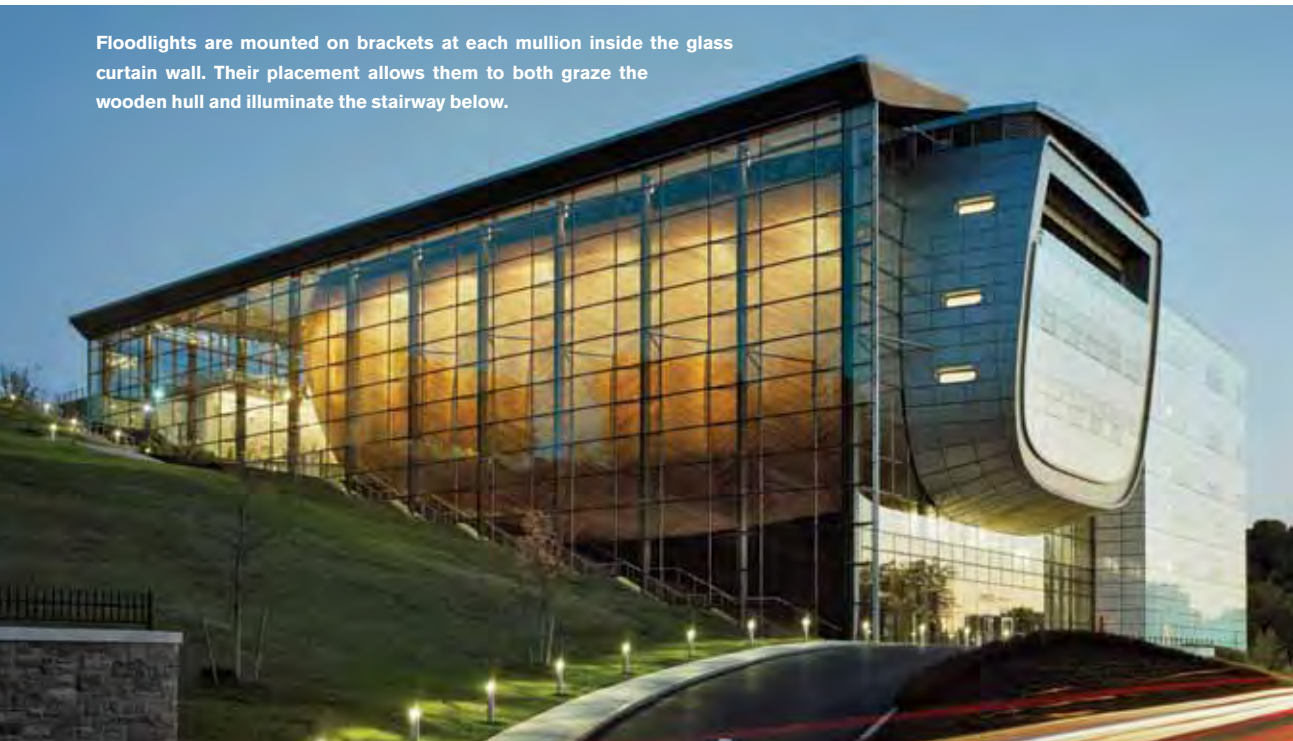
hall is black-tie, inside and out. Since “the project is all about seeing the wooden hull through the glass,” says Sundin, the team wanted the exterior of the hull to appear as brilliant as the interior of the concert hall. Halogen T6 and PAR 38 floodlights (ERCO) are mounted on custom brackets to achieve a gradation of light from the top to the bottom of the hull. The technique creates an even glow that makes an impact from multiple vantage points, whether the viewer is up close or looking in from the outside.

The luminaires are mounted on custom brackets at each mullion along the inside of the north-facing glass curtain wall for architectural cohesion. “The lights are tied into the structural modulation. Their specific position allowed us to sculpt the hull with a gradation of light, so that you read the roundness and fullness of the shape,” explains Sundin. The lights also illuminate the stairway that runs between the curtain wall and the concert hall, minimizing the quantity of fixtures needed to light the area.

The gradation of light wasn’t the only thing that helped the hull achieve a rounded, glowing effect. OVI also worked with the architect on choosing the right finish for the wood. “A common mistake is giving wood a shiny, gloss finish, but this results in re-



Floodlights are mounted on brackets at each mullion inside the glass curtain wall. Their placement allows them to both graze the wooden hull and illuminate the stairway below.





Round recessed incandescent downlights in the balcony ceilings light seats below and complement the scalloped profile of the wood. At the edge of the balcony ceilings, unobtrusive housings contain lighting and acoustic systems. One profile houses 3,000K LED uplights and the other holds speakers.

flections at the top of the wall where the light fixtures are typically located. So we recommended using a satin finish, which is more matte and minimizes glare,” notes Sundin.

The satin-finish wood hull is the first thing that greets visitors as they arrive at the entrance at the top of the hill. Recessed adjustable downlights and wall washers (Edison Price Lighting) illuminate the 35-ft-high lobby ceiling without detracting from the hull. The luminaires are fitted with 500-W PAR 56 lamps for dimmability and flexibility. “With dimmable PAR lamps the lobby can be a formal reception area or an informal meeting place,” says Peiniger.

OUTFITTED IN ACOUSTICS

Materials and finishes were also a concern in the concert hall, itself, where the acoustic design translated into architectural elements like textured wall panels, curved balcony ceilings and a convex fabric ceiling overhead that were a challenge to illuminate. “Acoustics were important to the owner, and we wanted to articulate this

by enhancing the sculpted acoustic panels on the walls. However, the panels are an unusual shape and computer modeling is not always an exact science,” notes Peiniger. After performing light calculations, the team built mock-ups with two full panel segments using 1-W, 3,000K LED uplights with a 10 deg beam spread (io Lighting) to illuminate the convex and concave patterned acoustic walls. The fixture’s unobtrusive 2-in. profile blended into the architecture so effectively that extra empty profiles were used to house and conceal acoustic speakers.

Another unusual surface is the precast curved balcony ceilings, which have a scalloped design that refers back to the acoustic wall panels. With so much architectural detail already in place, “it was important that we didn’t use a decorative luminaire,” says Sundin. “A lot of concert halls have a decorative eye-catcher like a chandelier or sconces. We decided that the architectural elements should be featured; decorative lighting fixtures were not appropriate.” Small, rounded recessed incandescent downlights with 100-W

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A-19 lamps (Edison Price Lighting) are positioned at the back of the scalloped profile to provide ambient illumination on the seats below.

The room's most ornate architectural element is its acoustic ceiling, which is constructed from tensioned fabric panels that are connected by stainless steel ties. The panels are organized in a spider web-like radial pattern that dips downward so that the central circle is the lowest point. "It's quite a challenge when you have seats that are sloping, a ceiling that is convex in two directions and a radial pattern, and you are trying to do wall-washing and downlighting. We had to take into account the reflectance value of the fabric and how the whole overall space was going to come together," says Sundin.

Given RPI's reputation for cutting-edge technology,

settings for a soloist or a small, intimate gathering, a medium-sized performance group like a three-piece orchestra and then a performance that would require all 1,200 seats," notes Peiniger. RGB LED uplights were used to light other areas of the concert hall, including the upstage wall.

CREATIVE CASUAL

Color-changing LEDs also make an appearance in the theater lobby, where 100-W floodlights and wall-grazers add character to the triple-height space. Inside, the theater architecture is less formal than the concert hall. Fixtures with an industrial feel were selected to complement the rough architectural aesthetic of the space. Surface-mounted downlights with machined housings (Hess)



LED uplights illuminate the textured convex and concave acoustic walls (left). On the ceiling (right), clamp-mounted PAR 56 floodlights are mounted between fabric panels. Linked to a preset dimming system, the lights provide illumination for a range of events.

LEDs were initially considered for the acoustic ceiling. Indeed, OVI explored the potential of using LEDs throughout the facility. "This strategy was implemented with the exception of the overhead lighting in the concert hall ceiling, where traditional PAR lamps are used, since the alternative LED technology was not available in time as a system solution," says Peiniger. "We are careful to ask, 'How much innovation can a project take?'"

OVI selected 500-W PAR 56 floodlights, each with a 22 by 44 deg beam spread (ERCO). The luminaires are clamp-mounted in gaps between the panels of fabric and are linked to a dimming system with preset schemes to accommodate a range of events. "We have different

recall hanging construction cage lights and a track-tube system with custom brackets (ERCO) echoes the streamlined form of metal scaffolding. The downlights illuminate balcony areas, while the track tube system hangs over the seats and can accommodate additional clamp-mounted fixtures for theater lighting. Both are fitted with 75-W PAR 30 lamps.

Intended as venues for performance art and theater-in-the-round, the two studios are more informal than the theater. The architectural language in these spaces is likewise casual, and the ceilings are made from wire rope. Basic 500-W PAR 56 clamp-mounted floodlights are mounted above the rope ceiling for general studio lighting.

While the lighting for each venue differs according to

its “dress code,” it is all subtly integrated into the architecture. One place where OVI broke the code and made an intentional statement through light was in the back-of-house corridors between the performance spaces and the public areas. “The director had a clear point of view that he didn’t want those spaces to feel disconnected,” explains Sundin. “So we played a game with RGB, the primary colors of light.” Red, green and blue exterior floodlights fitted with 26-W CLFs (we-ef) are mounted to the walls in the back-of-house areas. When turned on together, they combine to create ambient white light. Even in the back-of-house, the playful combination gives light the center stage. 📍

METRICS THAT MATTER

Experimental Media and Performing Arts Center at Rensselaer Polytechnic Institute

Watts per sq ft: 2.8

Illuminance Levels: vary

Lamp Types: 19

Fixture Types: 54

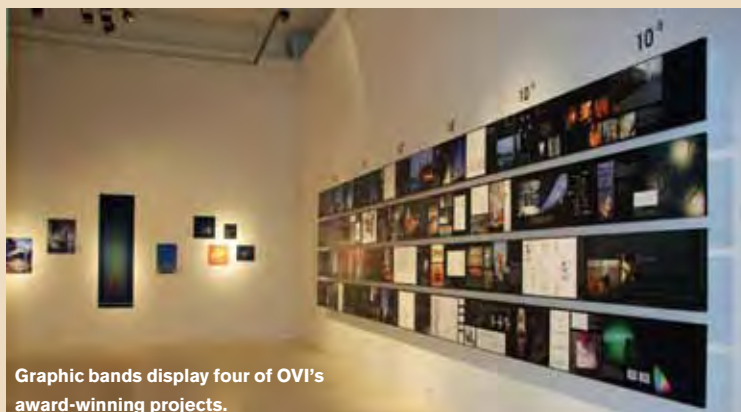


About the Designers: Enrique Peiniger, Dipl. -Ing., IALD, PLDA, Member IES (2006), is a founder and principal of Office for Visual Interaction, Inc. He is currently treasurer for the Professional Lighting Designers’ Association. Mr. Peiniger has taught courses at the Technical University of Berlin and Parsons School of Design, where he is a distinguished faculty member.



Jean M. Sundin, IALD, PLDA, Member IES (1994), is a founder and principal of Office for Visual Interaction, Inc. Ms. Sundin is currently director of education for the PLDA. She also co-authored IALD’s “Guidelines for Specification Integrity.” Ms. Sundin is a distinguished faculty member at Parsons, and has taught lighting courses for the IES and at design schools worldwide.

10 Degrees of Design



Graphic bands display four of OVI's award-winning projects.

How do you explain the process of lighting design? For Enrique Peiniger and Jean Sundin, the founders and principals of the Office for Visual Interaction (OVI), the solution was to break it down into powers of 10.

When asked to design an exhibit on their practice, Peiniger and Sundin developed a scheme that would quantify their approach to lighting. The resulting exhibition, “Lighting Powers of 10,” was on display at the Architecture Forum Aedes am Pfefferberg in Berlin from March 12 to April 25. The event marked the first time that the forum, which usually features architects, showcased the work of a lighting design firm. Past exhibitors included firms that OVI has collaborated with, such as Renzo Piano and Zaha Hadid.

Peiniger and Sundin organized the exhibit according to the degrees of detail that they consider while designing, from macro to micro. These “lighting powers of 10” range from the large-scale, panoramic view of a project—for example, the metropolitan area (10^{+5} m) or city master plan (10^{+4} m)—to its miniscule details, like optics (10^{-6} m) or the spectral properties of light itself (10^{-7} m). “The idea was that you start by looking at the global implications of a project and then you zoom in to its details,” explains Peiniger. “On every scale you have a different task. For instance, with RPI, if you think about the entire building, there is a logic and coherency to the lighting design. Then if you examine one particular space in the building, lighting performs a distinct set of tasks, but still relates to the larger whole.”

The exhibit showcases the designers as they thought, sketched, mapped and planned four of OVI’s award-winning projects: The New York Times Building, the Scottish Parliament, the U.S. Air Force Memorial and the prototype design of an LED streetlight for New York City. A collection of photos, working drawings, light calculations and full-scale models were featured alongside luminaires and other materials that were used for each project. “We did case studies of our own projects, then showcased them on 25-ft long graphic bands,” says Sundin. “The exhibition really highlighted our process of thinking and working through lighting design at each scale, for each project.”

- Elizabeth Hall