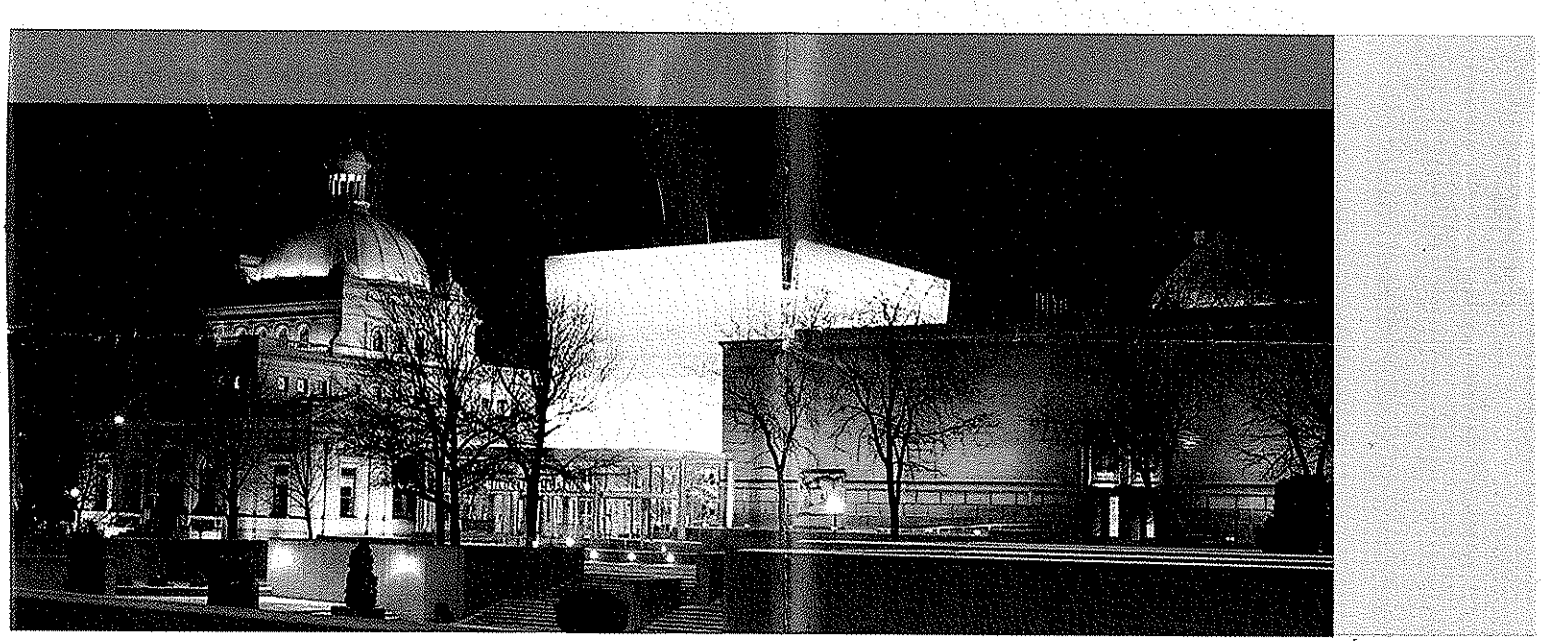
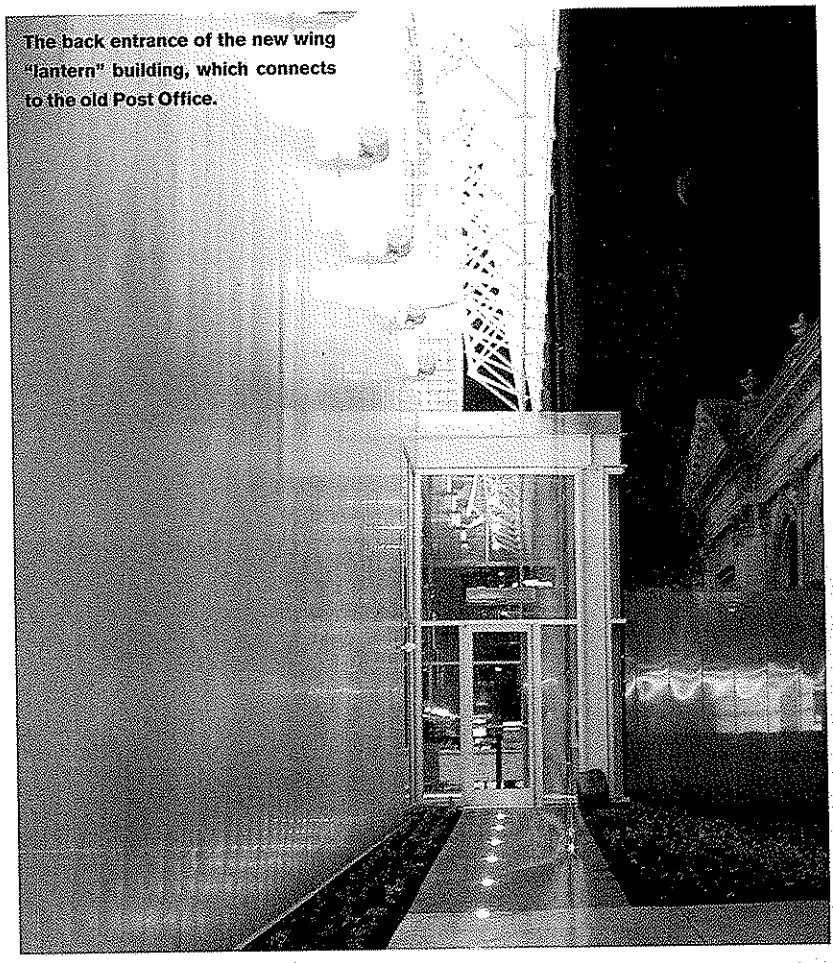
Lighting of the expanded Children's Museum of Pittsburgh celebrates—and integrates—three separate buildings



KIDS' COLLAGE

The Children's Museum of Pittsburgh is a busy and colorful place that prides itself on nurturing creativity in the children of Pittsburgh. It's also one of the most unique looking structures in town. It was only fitting that the museum won one of Pittsburgh's Cool Space Awards, in honor of its unusual urban space and its adaptive reuse of an important location in the city.

The Children's Museum was formerly housed in the old Alleghany Post Office building, a 20,000 sq ft structure built in 1897 with a four-story copper-domed rotun-



The back entrance of the new wing "lantern" building, which connects to the old Post Office.

da. The museum had outgrown this space and an expansion was planned to include another building across the street. This building, the 40,000 sq ft Buhl Planetarium, was built in 1939 and had been vacant since 1991. The planetarium's art deco design mixes classical architecture with allegorical sculpture in a forward-looking streamlined aesthetic. It is an example of "stripped classicism" that went to an extreme, having no visible windows. For decades, the Buhl Planetarium was a source of dreams and curiosity for generations of children who sat in wonder beneath its domed roof.

The museum conducted a design competition in 2000 for the proposed expansion. The museum's staff and board decided early on that the expansion would be a green design. Koning Eizenberg Architects, Santa Monica, CA, won the competition. (Perkins Eastman Architects served on the team as executive architects.) KEA proposed to link the two historic structures with a new wing in the shape of a glass lantern. The new wing would also be a metaphorical wing that would take children to new experiences. With the expansion, the museum more than tripled its original space from 20,000 sq ft to 74,000 sq ft.

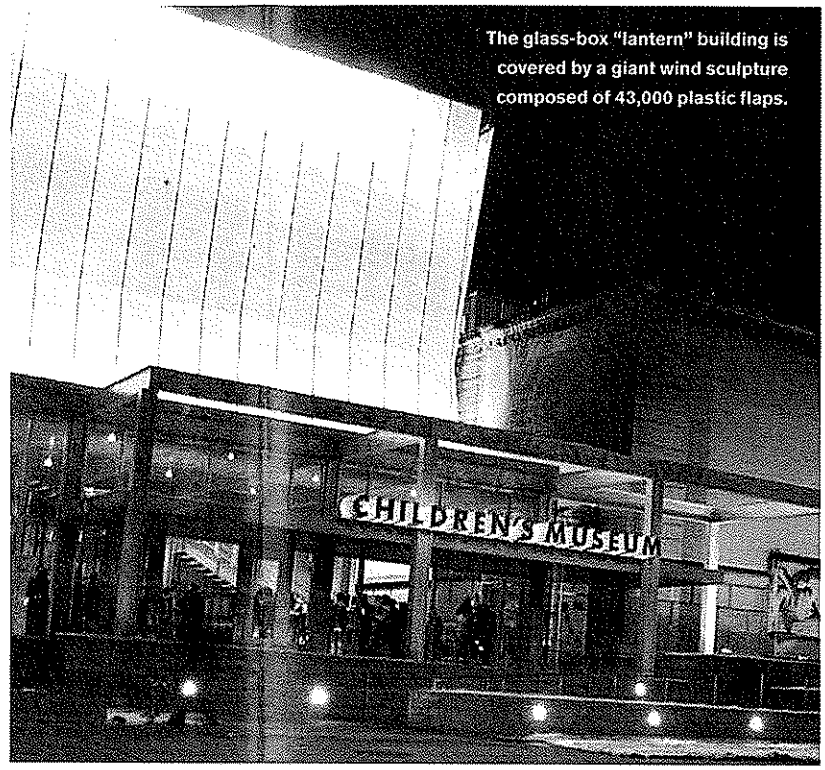
GLASS-BOX LANTERN

The new "lantern" building takes the form of a three-story contemporary glass box, covered by a giant wind sculpture designed by environmental artist Ned Kahn. Working closely with Koning Eizenberg and Vortex Lighting, Kahn designed a matrix of 43,000 thin, translucent plastic flaps, each five in. square to cover a steel frame. The flaps hang on stainless steel rods attached to a boldly graphic folded aluminum armature on the exterior of the building. The structure is dramatically visible within the new building's second and third story exhibits. The tiny flaps act as sunscreens that keep the glass from overheating and provide even and soft daylighting. The exact placement of the armature allows for even illumination from the back.

This dynamic wind sculpture is named "Articulated Cloud" and adds a touch of whimsy and lightness to the classical and heavy profiles of the existing structures. The weather in Pittsburgh successfully allows for the interactive play of the wind and the plastic together, so that the effect is a constantly moving fluid façade.

The plastic and steel used for this feature were made from recycled materials, helping to make

the museum a green building. The museum received a Silver LEED certification from the U.S. Green Building Council in March 2006, making it the largest Silver LEED certified museum in the country.



The glass-box "lantern" building is covered by a giant wind sculpture composed of 43,000 plastic flaps.

THREE INTO ONE

The lighting design celebrates the individual styles of all three buildings, like elements of a collage. The lighting also attempted to show that the buildings belong together as part of one institution, even though they have such dramatic structural differences. (Manufacturers supplying products for the project included Kim Lighting, Lightolier, Prudential, Orgatek, Shaper, Lumiere, Lumetta, Illuminating Experiences, Targetti, Finelite, Designplan and Luna Lighting.)

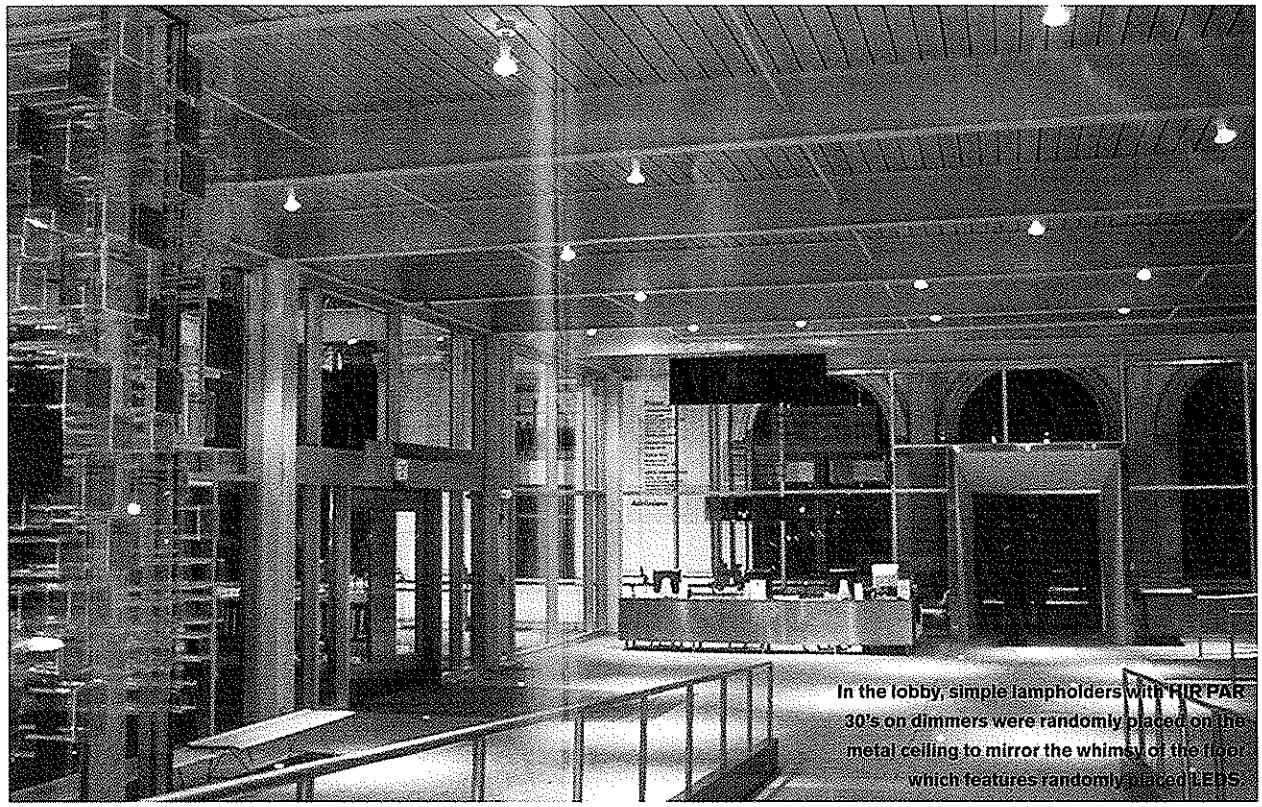
The lantern building was lighted so it can be readily identified as the main focal point of the museum. The first lighting design idea called for a soft glowing incandescent lantern. As the design of the façade progressed, and the white plastic flaps were chosen, a lighting mockup was done. The results showed that the plastic came alive and looked dazzling in a true bright white color, and that the warm incandescent light made the material look dull. A 4K mastercolor metal halide lamp was chosen for the floodlights which were mounted between the curtainwall of the building and the armature holding the plastic flaps. On the roof, retractable vertical pipes were placed eight ft apart around the perimeter with floods mounted at the top. These were engineered to spread light evenly on the back of the top half of the screen wall holding the flaps. The retractable base pole provides for easy lamp changes. The bottom half of the screen wall was lighted from floods mounted onto the core building, shooting up behind the flaps.

As a result of the mockup, the surrounding buildings were lighted with warmer colors. Shades of amber light for the Post Office and rose-colored uplight for the Buhl Planetarium were chosen. A mockup was done with theatrical gel. The evening color mockup was attended by the architects and the client, and as with any outdoor test in a public place, the "man on the street" always weighs in with an opinion. After the festivities, a consensus was reached.

Custom glass color was ordered which was later installed on those lights. Using these colors helps make the historic structures less imposing and more inviting to children.

Although amber was selected for the lighting on the Post Office building, there were mixtures of metal halide and fluorescent fixtures hidden in and around the façade. Therefore different shades of ambers had to be chosen to appear to match.

All the façade lighting was carefully directed to comply with



In the lobby, simple lampholders with RIR PAR 30's on dimmers were randomly placed on the metal ceiling to mirror the whimsy of the floor, which features randomly placed LEDs.

Inside inflatable balloons are 4000K metal halide lamps with a shatterproof glass shield.

dark sky requirements, therefore reflectors and glare shields were appropriately chosen. In addition, parking lot lampposts in traditional glass drop heads utilized integral directional downlight reflector shields for dark sky considerations.

The lantern building is by far the brightest and most impressive of the three structures and serves as a "beacon of light" or a "night light" for the neighborhood. After dark it seems to glow from within and it provides a shimmering display when the wind blows.

KIDS COME IN

The main entrance to the museum is located in the lantern building and to further the in-

tention of entering a fun place, small burial LED uplights in various colors were placed in the sidewalk of the ramped entrance and then continue into the entrance lobby floor. These were placed in a random pattern on the ground as if thrown like colored marbles on the floor. The children love to run to them and identify their colors. Because there is so little heat generated from them, children can touch and step on them and play games around them.

Simple lampholders with HIR Par 30's on dimmers were also randomly placed on the metal ceiling to mirror the whimsy of the floor. Narrow spot lamps were used for a more dramatic look at night. The far wall of the lobby is a floor-to-ceiling enclosed "climbing wall," on which kids can climb from the ground floor all the way up to the second floor. This unique wall acts as a centerpiece for the lobby and is covered in the front by ribbed polygal material. There is no light within the structure to prevent heat buildup. The structure is lighted from the back by halogen floods. Out-of-focus shadows of the children climbing on the wall play along the front face of this structure and give it the appearance of moving wallpaper.

BUHL BUILDING

The Grand Lobby of the Buhl Building is an expansive two-story room which has seating areas, a café and a retail store. The room was originally illuminated with 100-W A Lamps behind rectangles of glass recessed more than 20-ft high in soffits around the perimeter of the room. The marble walls and floors had always appeared dingy due to poor lighting and the lack of daylight.

The architects added a floor-to-ceiling glass window at the far end of the lobby which opened up the room. The effect was as if a tomb were being exposed to daylight for the first time. The appearance of the room changed dramatically. To make the size of the room less imposing, inflatable balloons ranging in size from eight ft to 12 ft in diameter were hung at varying heights. Inside of each is a 4000K metal halide lamp that is manufactured with a shatterproof glass shield to withstand the air pressure. The power for the air pump and the lamp comes via a photovoltaic system (solar power) located on the roof above.

The original recessed rectangular ceiling lights were retrofitted with fluorescent lamps and a line of HIR Par 38 track fixtures ring the perimeter to highlight displays in the space. The large planetarium dome was also painted white and uplighted with halogen floods creating a warm soft cover for the play space below.

Meanwhile, the theater in the basement of the Buhl was lighted with various lengths of stem-mounted low-voltage "light-drops" of 20-W T-4 halogen lamps on dimmers. This created kind of a starscape throughout the house. Cove-mounted fluorescent wall washers were colored with theatrical gel to match the wall coverings while display cases were highlighted with halogen monopoints.

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STOP BY THE POST OFFICE

The lantern building is connected to the old Post Office by an enclosed raised footbridge wrapped in metal. Uplights placed under metal floor grates project shadows on the walls and ceiling.

The fixtures uplighting the interior rotunda of the old Post Office were changed from sodium vapor floods to mastercolor

Par 30 metal halide directional lamps, and focused to provide smooth overlapping light. These highlight the intricate details of the rotunda with no unwanted spill on the surrounding walls.

Stairways within the facility became areas where various lengths of lexan-covered linear fluorescents were mounted vertically at different heights to create their own artistic statement while functioning as general and emergency illumination. Classroom and offices were lighted with direct/indirect fluorescent pendants and troffers with the occasional decorative chandelier or wall sconce in areas such as the kids' birthday party rooms. All exhibit lighting was designed by the museum's exhibit designers (Springboard Design) and mixed halogen and fluorescent light.

The Children's Museum of Pittsburgh is now a noteworthy destination for architectural aficionados, but more importantly, a place that will inspire, elevate and educate young minds.

About the Designers: Anne Militello, IALD, Member IESNA (2001), is founder and principal of Vortex Lighting, Inc., in Los Angeles. Her kinetic lighting design for the façade of the New 42nd Street Studio Building in NYC received the 2001 Paul Waterbury Award of Distinction, a Lumen Award and an IALD 2001 Special Citation. For this project, Ms. Militello became the subject of a BBC documentary. Other architectural projects include the Avalon and Viceroy Hotels in Santa Monica, Palm Springs and Anguilla, the Avenue K Shopping Center in Kuala Lumpur, the Adventures of Spider-Man attraction at Universal's Islands of Adventure that earned an Eddy Award, a TEA Award and "Lighting Designer of the Year" 1999 from Lighting Dimensions International.

Lisa D. Katz has been assistant lighting designer at Vortex Lighting for three years. Projects include the Herb Alpert Educational Village, Hollywood Roosevelt Hotel, Duta Plaza/Avenue K in Kuala Lumpur, Children's Museum of Pittsburgh, Artworks in New Orleans and the Viceroy Hotel in Santa Monica. Before working at Vortex, she was a lighting designer at Walt Disney Imagineering and has been a freelance entertainment lighting designer in Los Angeles. She has an MFA in Lighting Design from the University of Cincinnati College-Conservatory of Music.