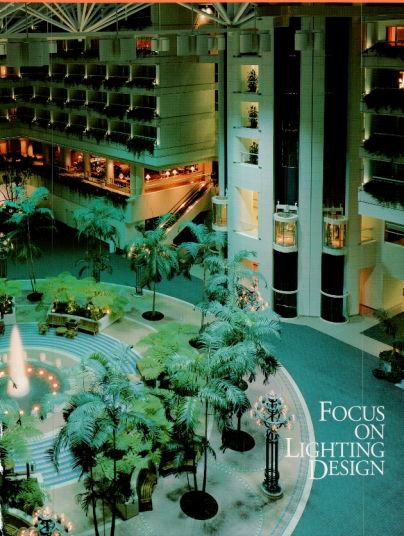




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DESIGN



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When lighting designer Robert Laughlin sent us a portfolio to select a few visuals for his Viewpoint, we were in for a treat. Photo after photo illustrated how thrilling and inspiring are the effects of lighting in architecture. In the course of an hour, without leaving the table, it was possible to tour some highlights around the state, from the theatrical impressions of night-lit bridges such as Dame Point in Jacksonville or Brickell Avenue in Miami, to the stunning portico of the Florida Supreme Court in Tallahassee, to Orlando's elegant Church Street Station and playful "kingdom of rock," the Hard Rock Cafe, and around again. We would recommend such an object lesson to any young architect who has not yet grasped the immense power of lighting.

We are fortunate in this issue to have been able to touch on a number of aspects of lighting, the practical as well as the aesthetic. KBJ architectural lighting specialist David Laffitte's glimpse into lighting considerations for the prizewinning Orlando International Airport will interest architects and travelers, alike. In each of our featured projects, as in many buildings in Florida, where sun is a great natural resource, daylighting has been put into play, consciously or not, whether for its energy saving possibilities or its reflective qualities. Lamp and lighting control technologies have changed so rapidly that "lighting" no longer is simply a matter of carefully choosing fixtures. Rather it involves the meticulous coordination of intelligence aimed at facilitating the variety of tasks at hand, while conceiving a broad range of moods and effects besides.

While the projects in this issue represent a cross-section of small and large firms, we would like to be able to present the work of smaller firms more often. The process for submitting projects to *Florida Architect* is quite easy. We publish quarterly, and each issue has a theme, although we interpret our themes rather broadly. For example, for our Summer issue on "Housing," we will consider vacation homes, rural and urban domiciles, even a college dormitory. Other upcoming issues will focus on Florida Schools of Architecture (Winter) and Working with CADD (Spring 1997). Once again, we would like to request your help in locating meritorious, well-photographed projects from around the state that fit within these themes.

In addition to projects, we also invite articles. We will consider feature-length articles on subjects of interest to architects in the state and viewpoints relating to pertinent legal or legislative issues, practice concerns, or other appropriate topics. One of our editorial goals is to publish more work of younger architects and more wisdom from experienced members of the profession.

Finally, in this issue we are initiating a section of letters to the editor. Whether this is a permanent feature is up to you. Let's hear from you. **MB**

*Florida Architect* serves the profession by providing current information on design, practice management, technology, environment, energy, preservation and development of communities, construction, finance, economics, as well as other political, social, and cultural issues that impact the field.

## In Defense of Architects: Engineers' BOPE Statement Halted

A five-year-old policy statement that purported to allow engineers to sign and seal building design documents has been set aside due to the efforts of AIA Florida. On December 11, 1995, the Florida Board of Professional Engineers (BOPE) voted to discontinue reliance upon the statement, which was drafted without public notice and hearings. AIA Florida had challenged the statement in an administrative hearing process on the grounds that the statement had been approved in violation of state law.

A joint stipulation has now been filed with the Florida Department of Administrative Hearings officially notifying the public that the "Commentary on Authority of Engineers to do Building Designs" has been set aside and is no longer a legal document. The joint stipulation was signed by BOPE, Florida Engineering Society, and AIA Florida attorneys.

AIA Florida sued the BOPE last year after the Commentary surfaced in response to complaints by the Board of Building Codes and Standards alleging that several churches had been improperly designed. BOPE responded to the charges by sending copies of the Commentary to building officials in Dade County as verification that engineers could sign and seal building documents.

Although the recent BOPE action and joint stipulation effectively declare the "Commentary" null and void, the issue is not concluded. BOPE has since voted to assign a committee to draft new language on the issue of engineers signing and sealing building documents for consideration as a rule at its next meeting.



Attending the legislative reception at the Capitol, from left to right: Secretary of State Sandra Mortham, Florida Foundation for Architecture President John Johnson, AIA, and Representative Marjorie Turnball.

## Florida Foundation for Architecture Unveils Florida Treasures

The Florida Foundation for Architecture unveiled *Florida Treasures: A Celebration of Florida's Historic Architecture* at the AIA Florida Legislative Reception on February 7. AIA members from around the state joined friends and supporters of the project, including Secretary of State Sandra Mortham and Representative Marjorie Turnball, to celebrate publication of the elegant 46-page book. Author Vivian Young was on hand to sign copies. The companion traveling exhibit will be touring communities around the state during 1996-97.

AIA Florida will continue to track BOPE and the rule-making process. Any further BOPE action that might allow engineers to sign and seal building design documents in violation of the architectural or engineering practice acts will be challenged by AIA Florida.

## Knight Steps Down as Dean

Roy Knight, AIA, will relinquish the post of Dean of the School of Architecture at Florida A & M University, Tallahassee, to move into teaching, research, and professional work at FAMU.

Since becoming Dean in 1988, Knight has been involved in the development of FAMU's academic and research programs, as well as the new

School of Architecture and Community design in Tampa. FAMU's School of Architecture is now ready for planned further growth with commitments for a major building expansion approved by the legislature.

"Now that the school is poised for its next period of advancement, it is a good time for me to pursue interests I have had to set aside. I am excited by the opportunity to become an active advocate for good architecture in the state, including continuing to serve AIA Florida."

## Florida Design Arts Awards

Florida Secretary of State Sandra Mortham presented the

1995 Florida Design Arts Awards to *Riverwalk in Fort Lauderdale* and the *Orlando International Airport Passenger Terminal Complex*. These projects "reflect the attention and sensitivity being shown to excellence in collaborative urban design in the state of Florida," said Mortham. The awards were presented in November at the Tampa Bay Performing Arts Center.

Accepting the awards for EDGA, which participated in both projects, were C. Douglas Coolman, Greg Meyer, and John W. Miller. Walter Taylor, FALA Chairman and CEO for KRI Architects, Inc. accepted the award for the Passenger Terminal Complex for the Orlando International Airport.

Entry kits for the 1996 Florida Design Arts Awards program are now available from: 1996 Florida Design Arts Awards, Florida Division of Cultural Affairs, Department of State, The Capitol, Tallahassee, FL 32399-0250; or contact Valerie Olsson at (904) 487-2380.

## AIA Design Awards Dates and Deadlines

Mark your calendars. Dates have been set for the AIA Florida Design Awards program. Calls for entries were mailed mid-February. Entry application forms must be received by March 15, and all entries must be received by April 24. The juries will convene in May, and awards will be presented on August 17, at the 1996 Summer Conference at Mariott Sawgrass, Ponte Vedra Beach.

This year's Chairs are Bruce Gora, AIA, Excellence in Architecture Awards Committee; Don Green, AIA, Unbuilt Awards Committee; and Joe Barry, AIA, Test of Time Award Committee.

## In Memoriam

Tampa Bay architect **William B. Harvard, Sr., AIA**, died December 11, 1995, after a long illness. He designed some of the most significant landmarks in the Tampa Bay area, including the Williams Park Band Shell, the St. Petersburg Main Library, the Biringer Center and Lewis House at Eckerd College. The Harvard firm, founded 57 years ago, now known as Harvard Jolly Closs Toppe Architects, is the largest locally owned architectural design firm in Central Florida. William B. Harvard, Jr., now serves as its president.

**C. Ellis Duncan, AIA**, Emeritus, of Vero Beach, died December 28, 1995. A Past President of the Palm Beach Chapter and State Director of AIA Florida, Duncan also was an active member of the Florida Engineering Society. He had a strong practice in school facilities in Brevard, Indian River and St. Lucie counties.

**Charles Ernest Daffin II**, a long time AIA member, died



*William B. Harvard, Sr., AIA, 1911-1995, Founder of Harvard Jolly Closs Toppe Architects, P.A.*

January 10, in Birmingham, Alabama. A lifelong resident of Tallahassee, Daffin helped organize and then headed the Florida Architects' Political Action Committee. A founding partner of Barrett, Daffin and Bishop, he most recently was employed by the State Fire Marshal's Office.

## Of Note



**Ronny J. Mateu, AIA**, Coral Gables, received the Miami Chapter's 1995 Silver Medal for Design, its highest honor. Mateu is President and Director of Design at Mateu Carreno Rizo & Partners, Inc., and has been a featured speaker on architectural design. His projects have been published nationally and internationally.

**Jim Anstis, FALA**, West Palm Beach, has declared his intent to run for a second term as Secretary of the American Institute of Architects. The Secretary is allowed to succeed to the office one time.

**Michael G. AuBuchon, AIA**, has been named a partner at Rason & Partners, Inc., Archi-

tecs. AuBuchon is the 1996 President-Elect of the Tampa Bay Chapter of AIA.

**David H. Webb, AIA**, has joined the Safety Harbor office of Fleischman Gurin as Project Manager. Webb has over 33 years experience in the design of education and government facilities.

# AIA FLORIDA DESIGN AWARDS

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color rendering. Available with either magnetic or electronic ballast, they also match the color appearance of halogen, fluorescent, and other lighting sources. Calulite's ProSpec, a complete system of interchangeable light sources, optics, and control media, also offers the flexibility of converting line or low voltage incandescent into metal halide. To learn more about these Lighthouse products, contact Bill Schoeter, (508) 646-3124.

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fortable and reduces heating and cooling bills. Compared to traditional housings, Air-Loc IC fixtures can reduce home energy bills by \$5 per recessed fixture per year. The downlights are available in a wide selection of sizes and trim styles. For more information, contact Perio Hayes at (708) 827-8880.



# Light and Energy: Remembering Daylight

By Walter Gronick, P.E.

Light is a crucial aspect of our daily existence. Some authorities estimate that over 90 percent of the sensory input a person receives in the course of a typical day is visual. Light, defined as visually evaluated radiant energy, is the key to the seeing process. Most outdoor activities—farming, mowing the yard, watching a parade, road construction—have historically been timed to coincide with the availability of daylight. The sky around us can provide more than ample light for most visual tasks during the daylight hours. When adequate energy and financial resources are available to a prosperous and technologically advanced society, traditionally daytime outdoor activities can be conducted at night—baseball under the lights and amusement park visits. Buildings, too, have historically been daytime environments. Fairly recent technological developments, however, have dramatically changed how we schedule, use, and design buildings. Electric lighting was the catalyst for this change, as well as the cause of a dramatic increase in building energy use.

Energy to cool a commercial building in the hot, humid South is typically distributed as follows: 30 percent is attributable to electric lighting, 20 percent to solar heat gain through glass, 15 percent to roof heat gain, and lesser percentages to internal and other loads. Obviously, energy used for lighting is an important design and operational consideration for a building owner. Light is necessary for the completion of simple tasks, for enhanced productivity, and for enjoyment of the built environment; but it comes to us at a substantial cost. On a residential scale, because of different design and usage traditions and less demanding tasks, lighting is not a very large part of the energy-use pie.

The importance of lighting to energy efficiency is reflected in the standards developed to regulate this aspect of design. The *Florida Energy Efficiency Code for Building Construction* contains a section addressing lighting energy consumption in commercial buildings. Likewise, ASHRAE Standard 90.1 (the most commonly used nonresidential national energy standard) allocates a chapter to efficiency requirements for lighting. Residential energy standards are typically silent on the issue of lighting energy efficiency. Efficiency is generally defined as the ratio of system output to system input. The greater the lighting output per unit of electric input, the more luminously efficient the system. Rather than address system efficiency directly, U.S. energy codes and standards tend to prescribe a lighting power budget (in watts per square foot) which a designer can meet in any manner that seems most appropriate.

The energy consumption of an electric lighting system is primarily a function of four factors: task requirements, the light source, light distribution, and controls. Building designers should take a serious look at the quantity of light that must be delivered to a task (known as illuminance) as a means of reducing lighting energy demands. All other factors being equal, the less light to be delivered, the less energy consumed. The Illuminating Engineering Society of North America publishes guideline illuminance recommendations for hundreds of task situations. Only the project architect, however, can rationally determine what tasks will occur where within a yet-to-be-constructed building. Task analysis is the starting point for an efficient lighting system.

Obviously, the ultimate source of electric light is electricity. There are, however, a number of ways to produce light from moving electrons. Less than one hundred years ago the first commercial electric lamps came on the market and initiated a radical change in the way we design buildings. The first electric lamps (manned light sources) were incandescent, where an electric current is used to heat a filament until it glows (incandescence) and emits light. This is a proven and effective, but inefficient, means of producing light. In the 1940s, fluorescent lamps operating on an entirely different principle (gaseous discharge) were introduced. The relatively high luminous efficacy (light output to electric input) of fluorescent lamps signaled a revolution in building design through the ability to provide high illuminance levels in a building without massive overheating and without reliance on daylight. Design was freed from historical precedents, but the price for this freedom was energy consumption.

Over the past thirty years, ever more efficient electric light sources have been developed. Many, such as metal halide lamps, have found a ready home in buildings; others, like sodium vapor, have been relegated to exterior applications because of color rendering concerns. The march toward more efficient sources has not stopped; T-8 lamps are rapidly replacing T-12 lamps as the norm. Electronic ballasts are replacing magnetic ballasts. Government labs and lamp manufacturers continue the quest for greater luminous efficiencies. The federal Energy Policy Act of 1992 dictated that certain commonly used lamp types no longer be permitted in the U.S., a mandate that will soon reduce the palette of available choices.

Light emitted from a lamp must be delivered to a task in order for the light to be useful. The task may be surgery, climbing the stairs, or providing appropriate background brightness in a space, but in any event the light source will normally be distant from the task. The more effectively light is conducted from lamps and luminaires (fixtures) to tasks, the more efficient the lighting system. It is possible to have very efficient lamps and very inefficient distribution; the result is an inefficient lighting system. Lighting design is a multi-disciplinary endeavor. Manufacturers produce lamps and luminaires; an engineer or architect will select lamps and luminaires for a particular application; but only the architect can ensure efficient distribution. This is achieved through design and specification of material and content reflectances, source locations relative to tasks, and general proportions of the space.

Lighting controls are an emerging area of focus for efficient lighting systems. A lighting system only consumes energy when it is turned on and only need be turned on when there is a task to be completed. Controls may be manual or automatic. In general, automatic controls will provide greater energy savings as they are not forgetful or lazy. A number of energy-efficient Florida buildings have made effective use of occupancy sensor controls in spaces that are not continuously occupied.

For thousands of years, buildings were primarily daylighted. Of course candles and oil lamps have long been available, but they are not efficient or powerful light sources. The image of Abraham Lincoln reading by candlelight suggests the luminous quality of most



historic buildings after dark. The development of electric light sources and an electric distribution system to support their operation changed this picture. It was possible to be overwhelmed by illuminance 50 feet below ground or 150 feet and six partitions away from an exterior wall. Building forms changed; the art of daylighting was generally forgotten.

Tapping into the naturally available daylight source (the sky surrounding a building), distributing daylight effectively to tasks, and providing appropriate controls are the essence of daylighting design. The main differences between daylighting and electric lighting are that daylight is variable and comes from outside the building envelope, whereas electric light is constant and comes from within the building envelope. Dealing with these differences is the key to successful daylighting.

Radiation from the sun consists of three main components: infrared, ultraviolet, and visible. The infrared portion makes itself felt as heat and contributes nothing to seeing. The ultraviolet portion can play havoc with materials and people and also contributes nothing to seeing. Only the visible portion is light.

Interior light harvested from daylight is often viewed as a "free" energy resource. From the purchase and payment point of view this is correct. Additional first and design costs may, however, be incurred to properly collect and distribute this resource. There are ample examples and documented case studies to suggest that the skillful use of daylight—collecting visible radiation, avoiding ex-

cessive infrared radiation, controlling glare, and shutting off unneeded electric lighting fixtures—can substantially reduce the amount of energy required to illuminate a building. Daylighting can also improve the ambience of a building and has been shown to increase productivity among workers.

The Department of Management Services (DMS) prototype office buildings in Tallahassee and the Florida Solar

has dramatically increased, efficient lighting accounts for the majority of this performance. This efficiency was achieved through the specification of reasonable illuminance levels, the use of efficient lamps, ballasts and luminaires, and occupancy sensors for lighting control.

The new FSEC Energy Center uses both efficient electric lighting and daylighting to set a new standard for energy efficiency in Florida. The electric lighting system requires just 6.9

diminable ballasts to adjust overall lighting levels as daylight increases or decreases.

It is no secret that lighting accounts for a major portion of the energy bill in any commercial or institutional building. However, use of efficient lamps and fixtures, consideration of the distribution of light to tasks, and control of light when not needed can greatly reduce the energy burden associated with lighting. Skillful design of daylighting systems can take such reductions even farther, with potential side benefits to the overall quality of design.

#### For further information:

*Advanced Lighting Guidelines*, U.S. Department of Energy, DOE/E-0908 (available from National Technical Information Service), 1993, is an excellent review of reasonably current thinking regarding energy efficient lighting systems and components.

*Daylight in Architecture*, by Benjamin Evans, McGraw-Hill, 1981, although 15 years old, is a readable and wonderfully illustrated introduction to daylight in buildings.

The Building Design Assistance Center, Florida Solar Energy Center, Cocoa, Florida, can provide a wealth of information on electric lighting components and daylighting design for Florida's environment.

*Walter Grondzik, PE*, is an Associate Professor, working with the Florida Design Initiative at Florida A & M University School of Architecture, Tallahassee.



Daylight floods the 4,000 square foot visitors center of the Florida Solar Energy Center. Comfort and energy efficiency are protected by the special window glazing, which lets in 87 percent of visible light while blocking off all but 2 percent of infrared heat.

Energy Center (FSEC) facility in Cocoa provide examples of how energy savings can result from energy-efficient lighting design. Metered electricity consumption for the DMS prototype offices in mid-summer 1995 was around 2.0 watts per square foot. This includes all electric uses (computers, lights, air-handlers, etc.) except chillers and is lower than just the lighting load in most office buildings built during the past twenty years. As computer use

watts per square foot as a result of the use of T-8 fluorescent lamps, efficient fixtures, and electronic ballasts. Spectrally selective window glazing improves daylighting effectiveness by providing high light transmittance (56 percent) but low nonvisible transmittance (shading coefficient of 0.33). Building orientation and form were architecturally manipulated to make best use of the daylight available on the site. Photometric sensors control continuously

## Sophisticated Showcase

**Residence of  
Chapman J. Root II  
Ormond Beach, Florida  
William Morgan  
Architects, P.A.**

When the first plans were drawn for the Root Residence, its setting was to be a 135-foot wide lot overlooking the Halifax River, the inter-coastal Waterway. Initial sketches envisioned two three-story towers set well apart and linked by bridges. The glazed west wall of the connecting space would permit views of the waterway, while sunscreens would deflect the afternoon sun.

Then the site was changed to an 80-foot wide oceanfront lot on the Atlantic. Securing privacy from neighboring residences and the sheer highway meant adjusting the original fenestration plan. Also, a maximum permitted building height of 30 feet on the new site necessitated some additional modifications to achieve the desired intention.

To gain height for the interior volumes, the site was excavated five feet into the dune. This permitted ceiling heights to range from 9 feet on the lower floor to 13 feet on the piano nobile, the second story, to more than 31 feet in the glazed refectory hall overlooking the pool terrace and ocean.

The south tower contains changing rooms on the terrace level, a secluded study above, topped by a crew's nest. Occupying the north tower are the kitchen and an informal living area on the lower floor, a library (accessible from the foyer by means of a bridge) above, topped by the master suite. Guest accommodations and service spaces are located in the floors above the garage.

Load-bearing, fluted concrete-block walls support the architectural masses of the



*Glazed refectory hall overlooks the pool terrace and ocean.*

6,500 sf structure. The walls support horizontal floor and ceiling planes that project alternately from east to west and from north to south. Stair runs of varying lengths interconnect the constantly changing levels of the interior. As a result, moving through the house, one's viewpoint always changes, and ceiling heights alternately expand and compress.

Daylighting was a major determinant in designing this beachfront residence. Since major glass areas face the dominant view to the east, special emphasis was given to controlling the morning sun by such devices as vertical fin walls, horizontal overhangs, adjustable blinds, and the refractory sunscreen which is controlled by photoelectric cells. In the evening the entry terraces are illuminated by lanterns integrated into the garden walls, and a sophisticated control system provides five separate moods for lighting throughout the residence, terraces, and gardens.

As a precaution against coastal scouring during severe storms, the entire structure is supported by auger piles. A concealed gutter around the edge of the terrace controls stormwater runoff during northeasters and hurricanes. And for the 20 x 25-foot glass wall of the refractory, four tempered, 3/4-inch glass fins stiffen the glass plates against wind velocities of up to 120 mph. Horizontal concrete box beams above and below the window transfer windloads to adjacent reinforced-concrete walls.

Throughout the design process, another priority was to create opportunities throughout the home to display the owner's collections, including specially commissioned glass sculptures by noted artist Dale Chihuly. Also, automobiles selected from the owner's extensive collection



Night lighting accents the towers and many interior levels.

are showcased in a grand pavilion. Visitors, after leaving their own cars in a landscaped parking section, walk through a grass-covered forecourt to this area.

As they continue toward the entry, visitors ascend three low terraces defined by a garden wall, masonry lanterns, and dense landscaping. Proceeding through the foyer, they are

surprised to find themselves a full floor level above the refractory hall and pool terrace. From there they can view the cascading pools that flank the pool terrace and the path leading through the dunes to the beach.

**Architect:** William Morgan Architects, P.A.  
**Principal in charge:** William Morgan, P.A.  
**Project Team:** Theodore Strader, AIA, Ronald Scallio, AIA, Thomas Duke, AIA  
**Structural Engineer:** William Simpson, P.E.  
**Landscape Architect:** Glenn Herbert, ASLA  
**General Contractor:** Foley & Associates  
**Interior Designers:** Pasanella + Klein; Wayne Berg, AIA, Albert Ho  
**Owner:** Chapman J. Root II  
*Photographs by George Cotti, Chroma, Inc.*



Dual towers rise from the dunes, which conceal auger piles and other precautionary devices that protect the structure from coastal storms.

## A Plan That Came Together

**Palm Beach South County  
Civic Center  
Delray Beach, Florida  
Robert G. Currie &  
Associates**

**A**lthough it was born in controversy, the Palm Beach South County Civic Center has drawn praise and crowds from the day it opened in January 1994. Completed after years of debate and changes in both plan and site, the 14,000-sf multi-use facility has become a real center for the community.

Located on 1.2 acres of a somewhat remote 5-acre site south and west of town, the civic center is assembled toward the heart of the larger site, for which future buildings have been proposed. Visitors encounter the striking glass and stucco facade of salmon, beige and aquamarine.

Local groups and organizations are taking advantage of the center's very practical components, including classrooms, a kitchen, and a 600-seat auditorium. A soundproof wall system allows the auditorium to be used as a large hall for performances and lectures or divided into four autonomous meeting or recreation areas.

The solid cube of the assembly hall is the nucleus of the facility. Three smaller ancillary structures radiate from the center, guided by a curved bisecting wall. The free-form lobby creates a fluid relationship between the assembly hall and its satellites. The arrangement of smaller elements around the entry cascading from the curve, effectively diminishes the substantial mass of the hall, effecting a harmonized assembly open to its surroundings. The standing seam metal roof of each element, although basically similar in shape, shows a deliberate variation in its slope and orientation. Likewise, varying depth of color of the independent roof



*Entrance and main facade. Deliberate variations in roof pitch, orientation, and depth of color distinguish each part within the whole. Photograph by Chuck Wilkins*

sections helps distinguish each pod within the whole.

Each geometric element houses a separate function and is independent in terms of sound, HVAC, and lighting capabilities. Largest of the satellites is the administration complex, comprising offices and a conference room. A multi-tone system with cooled condensing units promotes energy efficiency.

Natural sunlight illuminates the glass-enclosed lobby; and at night, a continuum of spot lighting flies above the curved separating wall, reinforcing the initial design concept. Lighting in the auditorium is direct and dramatic. Pendant downlights hanging on a level plane from the sloped and exposed structure create an implied ceiling of light across the entire expanse. Three suspended ceiling planes over the stage area provide both acoustical treatment and positions for spotlighting.

Since the facility opened it has seen capacity use by civic groups and private users. The center's flexible multiuse plan is proving the perfect accommodation for a variety of formal and informal user needs, including meetings, classroom programs, social events including weddings and religious gatherings, and small stage productions.

**Architect:** Robert G. Currie & Associates

**Principal in charge:** Robert G. Currie, AIA

**Landscape Architects:** Palm Beach County Parks

**Structural Engineer:** O'Donnell Saccaruto Mignogna, Inc.

**Civil Engineer:** Sieremeta Associates, Inc.

**Mechanical/Electrical Engineer:** Thompson Engineering Consultants, Inc.

**General Contractor:** Select Contracting, Inc.

**Owner:** Palm Beach County Capital Improvements



*Pendant lighting illuminates the auditorium, which can be used as a large hall or divided into four autonomous areas. Photograph by Dan Florio*



*Daylighting and downlighting highlight painted accents and dramatic expanse of ceramic tile flooring in free-form lobby, which doubles as an exhibition space. Photograph by Chuck Wilkins*

# Lighting Design as an Integral Part of Architectural Design\*

By David M. Laffitte, AIA

## Orlando International Airport, Phase II Orlando, Florida KBJ Architects, Inc.

In 1987, KBJ Architects began design of one of the largest projects in the Southeast: the Phase II Expansion of the Orlando International Airport. The original construction (also designed by KBJ Architects) consisted of one landside and two airside buildings. Shuttle trains connect the concourses with the main terminal.

The Phase II Expansion more than doubled the size of the landside facility, including a 450-room hotel and parking garage on top of the building. It also added a new airside terminal, which became a hub for Delta Airlines, serving domestic and international flights. Together the projects represent 1.7 million sf of enclosed space and over \$200 million in construction costs.

Since it serves as an arrival point for millions of visitors annually, the client wanted the experience of the facility to be both pleasant and particular to Florida. The architectural intent was to evoke the essence of Florida: "light and sunny" were characteristics we sought to include in these structures.

From the start, lighting design was an integral part of the architectural design. Partner-in-charge and project designer Walter Q. Taylor, FMA, decided that all lighting design for the public spaces would be developed first by KBJ, and then handed off to the engineering team. It has been our experience that early consideration of lighting results in a more successful project. There is an interplay or "synergy" between the design of interior spaces and the lighting of them which benefits both.

The design approach we took

was, in simplest terms, to integrate the lighting with the architecture. Walls and defining planes are illuminated with wall-wash fixtures. Architectural features and circulation nodes are articulated by the design of the ceilings and lighting. Where ceilings are conceived as a neutral element, such as in the ticket lobby, low-brightness

ing, most of the lighting fixtures chosen were standard catalog items. Though a small part of the total, the most memorable fixtures are the custom-built ones we developed for special applications.

*Rental car and ticket counters*  
The need for custom fixtures first became evident while de-

no suitable off-the-shelf product and that a custom fixture was the only solution.

The design that emerged can be thought of as an indirect, fluorescent fixture that carries its own reflector: Compact fluorescent lamps and ballasts are fitted into a 3-1/2-inch diameter aluminum extrusion. For the shade we chose perforated aluminum; we reasoned that it would be both durable and easily cleaned, as well as being nonflammable. The units are constructed in 11-foot 6-inch lengths to coordinate with the 34-foot bay sizes of the building.

Southern Manufacturing Company of Orlando was selected to construct the fixture. Despite their well-equipped plant, we had some initial misgivings about their ability to produce the fixture: their principal product line did not include lighting at all. However, after a mock-up was constructed and a decade of connections refined, we gained confidence in the firm's technical ability. Having ready access to their plant was invaluable in the development of the final details of the fixtures.

The higher ceiling of the ticket lobby invited the design of a larger fixture. The radius was increased to just over two feet. A 5-inch extrusion was selected for the lamps. These units are constructed in 17-foot lengths, with six 5-foot lamps, to coordinate with the 34-foot structural bay of the building. They also align with the rows of ceiling-recessed fluorescent fixtures perpendicular to the ticket counters. The typical (total) counter and fixture length is 150 feet.

### *Elevator lobby*

Two-story-high columns stand in front of a pair of elevator entrances. We took advantage of their grand scale to create light columns. Heavy-gauge



*In each concourse, custom indirect light fixtures bracketed off the columns provide ambient lighting to supplement daylight from the windows and continuous skylights.*

fluorescent and HID downlight fixtures were employed. In other areas, where more definition of the ceiling was desired, the rental car lobbies for instance, indirectly lit coffers add scale and drama. Indirectly lit coffers were also used in the baggage claim lobby to aid in the identification of elevator and escalator cores. For reasons of econ-

signing the rental car counters. We were looking for a pendant fixture to bring down the scale at the counter to reflect the person-to-person nature of the transactions. We wanted the friendly glow of a lamp shade, in a linear-form, and we needed to provide comfortable task lighting for agents to work. We quickly realized that there was



*In the Great Hall and Hyatt Hotel atrium, streetlight fixtures and a lighted fountain help create an urban park atmosphere.*

perforated aluminum and a translucent liner shield four-lamp industrial fluorescent fixtures mounted vertically on the face of the columns.

#### *The Delta Airside Building*

The lighting design of the concourse began with the decision to take advantage of available sunlight; artificial lighting is supplemental. Full-height clear laminated glass is used continuously along the perimeter of the concourses, affording views and light. Trellis-like white metal baffles provide shading of this glass and redirect light into the building.

A continuous 5-foot-wide skylight down the center of each of the three concourses provides top-lighting to balance light from the windows. The ceiling arches up to the skylight to distribute the light more evenly. The decision to light the curved ceiling indirectly seemed the only logical choice; fluorescent fixtures suited the linear nature of the space, and bracketing the fixtures off columns provided a way to integrate the indirect cove details of the outer bays with the center bay.

The fixture was conceived as a companion to the fixtures

designed for the ticket and rental car counters, hence the curved perforated metal form. This fixture has some obvious differences, however. For higher lumen output, continuous rows of 40-watt compact fluorescent lamps were chosen. A reflector directs light from these lamps toward the ceiling. To create the glowing effect from below, standard 40-watt fluorescent lamps are mounted on both sides of a supporting center steel tube. The perforated metal dish is lined with translucent plastic to shield the lamp image. These fixtures were fabricated in 27-foot

lengths; the total installed length is 1,438 feet.

Around the semicircular skylight well at the ends of each concourse, decorative wall sconces utilize two-lamp 13-watt compact fluorescent wall-pack units shielded by a lined, perforated metal shade.

#### *Airside Concessions Atrium*

The center of the airside building features a 150-foot-diameter skylight supported by six steel truss-columns—that is, three 24-inch-diameter steel tubes in a triangular cluster. To accentuate them we developed a bollard-

*Continued on Page 18*

## Lighting Design as an Integral Part of Architectural Design\*

Continued from Page 17

like fixture which utilizes a standard metal halide fixture to uplight the columns. Slotted metal cylinders with translucent Eners provide a glow at the base of the columns. These are fitted with 13-watt compact fluorescent lamps. Because the columns are joined at the base with three one-inch-thick horizontal steel plates, the custom fixtures were constructed in nine separate sections and fitted between the plates in the field.

**Great Hall - Landside Building** A 450-room hotel surrounds the primary public circulation space of the airport, creating a six-story skylit atrium which was designed to be perceived as outdoor space. Lighting design had to consider the visual comfort of both the passengers at "street" level and hotel guests above.

To reinforce the perception of the atrium as an urban park, we designed special streetlight fixtures with clusters of clear glass globes. Clear incandescent lamps are used for their sparkle, though they are dimmed slightly to extend lamp life.

Clusters of palms surround the fountain at the center of the atrium. Because the skylights admit only 14 percent of available daylight, supplemental lighting is required for the palms during the day. Clusters of narrow-beam adjustable ILLD downlights were designed for this task. These are suspended from the skylight structure at 75 feet above the floor and each contains four 400-watt metal halide units for daytime use and a single 250-watt mercury unit for "moonlighting" effects at night.

To accentuate the archi-



*Reclining fixtures provide a pleasant glow and comfortable task lighting for ticket agents.*

ture of the hotel, compact fluorescent uplights illuminate each balcony column without disturbing guests or producing glare from below. Uplighting of the fountain jets, and accent lighting within the planters

complete the lighting of the atrium. The combination of these sources and spill light from the hotel provide efficient and pleasant ambient lighting for general circulation.

Throughout the entire project we took every opportunity to enhance the distinctive features of the architecture with lighting. Whether providing visual cues to aid circulation or reinforcing architectural rhythms, the lighting design was a carefully considered part of the whole. This is an approach that can work for any project, whatever the scale. Lighting is one of the elements of architecture, and it can be a powerful design tool.

*David M. Laffitte, AIA, is a Senior Vice President with KJB Architects, Inc., Jacksonville and Orlando, Florida.*

**Architect:** KJB Architects, Inc.  
**Principal in charge:** Walter Q. Taylor, FAIA  
**Lighting:** KJB Architects, David Laffitte, AIA  
**Structural Engineers:** Kary Young Chiu & Assoc., O'Keeffe & Company  
**Mechanical Engineers:** Newcomb & Boyd, R. Douglas Stone & Assoc.  
**Electrical Engineers:** Newcomb & Boyd, Matern Professional Engineers  
**General Contractor:** Great Southwest Corporation  
**Owner:** Greater Orlando Aviation Authority

*Photographs by Kathleen McInerney*



*In the Delta terminal, bollard uplights illuminate the columns that support the great central skylight.*

\*This piece draws substantially from "Delta Lands a Winner," by David M. Laffitte, May 1992, *LD+A*, 41/02, published by the Illuminating Engineering Society of North America, 120 Wall St., New York, NY 10005.



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## Carving Out a Downtown Niche

**Urbanform Design Group  
Architecture and Interior  
Division Office  
Fort Lauderdale, Florida  
Urbanform Design Group,  
Inc.**

**S**andwiched between mostly mundane commercial and office buildings in downtown Fort Lauderdale is the dynamic and colorful office of Urbanform Design Group, Inc. Friends were surprised when, in January 1984, the firm leased two narrow, shotgun storefront spaces in a dilapidated building a block north of City Hall. Transformation of the 3,600 sq space into separate but integrated offices by—and for—the firm's architecture and interior design divisions would be an interesting challenge.

The group was determined not to let a tight construction and renovation budget (\$56,000) dictate a low-budget look. Much of the charm lies in the imaginative use of space and of inexpensive and stock components.

A central hexagon encompasses office areas for the division managers. Large interior windows created open interior vistas as well as allowing greater access to the linked exterior view. An octagonal conference area and other angular walls help break the monotony of the long, narrow space on the architecture side.

An open, landscaped space was created for the interior division using columns and wood beams to create seven rectangular bays. Each bay displays a different selection of colors and materials compiled from samples received from distributors, including marble, slate, tile, wood, and other natural and fabricated materials.

Striking columns feature a variety of faux finishes and wall coverings. Besides adding an



*Reception area and octagonal conference room incorporate an unusual range of colors, textures, furnishings, and natural and artificial lighting effects.*

interesting blend of textures, this concept has proven to be popular with clients, who are able to see how the materials and finishes they are considering look installed. Likewise, exposed air-conditioning ducts and electrical raceways serve as a hands-on learning environment for clients.

Special attention was paid to color and lighting. A slightly unconventional approach led to variety over homogeneity. Innuent colors—lots of them—and assorted lighting fixtures help interpret functional areas. Stock fixtures, in a carefully selected combination, serve both practical and decorative functions. Pendant fixtures complemented by desk lamps provide general and individual lighting in the drafting areas,



*Angular walls with sharp verticals elude monotony in passage-way of architectural section. Interior glazing and light color walls in conference room and principal's office add open feeling to closed spaces.*



*Interior design section, with exposed air-conditioning ducts and electrical raceways. Bays defined by wood beams and columns contain an interesting array of installed sample treatments for clients to encounter. Floor finishes by Karou Corp.*

while track lights accent walls and art work. The interior design section is lit with tracks for general lighting as well as to highlight displays. In the transit and reception area and in the coffee room, wall sconces help create drama and definition. Reflections caused by the different types of light, with or without added daylight, vary the intense colors, broadening the color spectrum even more.

Lest it sound like a hick-schicker look prevails, the result is quite the opposite. Forest green and deep purple, the colors of the firm's logo, define principal spaces. Flooring in the public zones, including the

reception and conference areas and the principal's office, is an expanse of slate. Work areas, such as the drawing room are installed with carpeting in the logo colors.

Surrounded by a neighborhood of neglected buildings, first-time visitors are generally surprised to find themselves

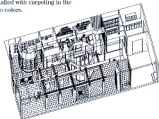
in this jewel-like space. Besides their own project to create a vibrant office space from a bombed-out shell within a budget, Urbanform Design Group, Inc. specializes in single and multi-residential architecture and interior design.

**Architect:** Urbanform Design Group, Inc.

**Design Team:** Balzer Tilly, AIA, Thierry Kawczynski, Assoc. AIA

**Interior Design:** Beth Kaplan, Cristina Towre

*Photographs by Roy Croyen*





Museum of Science and Industry, Tampa, Florida  
Architect: Robbins Bell & Kreher Architects Inc., Tampa, FL  
and Antoine Predock, FAIA

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# LETTERS

## Can Engineers Practice Architecture?

As a professional engineer licensed to practice in Florida, I find Mr. Huey's article in the Fall 1995 issue to be highly biased. Having been involved with NSPE's review of the Federal anti-trust investigation, I know there is a great deal of vague misinformation thrust upon the public, building officials, engineers and architects by such biased articles. There are a number of other cases nationwide which shed light upon the division line between the practice of architecture and the practice of engineering. As general counsel of the Florida AIA for 20 years, Mr. Huey's bias is understandable, but his article only represents his opinion.

The fact is, most statutes specifically exempt engineers from the statutes applicable to architects, and vice versa. Most building codes recognize the design professional as either an architect or an engineer. The debate as to who may lead and who may follow is largely academic. Both boards were created to protect the interests of the public, and in that purpose there is common ground. Registrants are qualified based upon their training, education and experience by both boards. Although an electrical engineer is registered as a professional engineer, it would be uncommon for him to complete the structural design of the tower and foundations which hold up his cables, although legally (under the law) he can accept a contract for design of a power transmission system. As a registered professional he is charged to practice in areas only in which he is competent by training, education and experience. He is expected to associate a structural engineer as required by the assignment. Similar par-

allels can be drawn in architecture. There are those architects who specialize in residential work, just as others specialize in health care, educational, high rise, commercial, etc.

It is the individual registrant's responsibility to competently carry out any assignment they accept; by affixing their signature and seal, they certify they have.

Consider for a moment the medical profession. A general practitioner would not attempt a heart transplant or brain surgery, although all are medical doctors.

The division line between architecture and engineering is a purely rhetorical, academic discussion which is more of a turf battle for clients than in protection of the public's interests. The public's interest is served by the employment of a design professional who competently carries out his assignment.

Each professional should practice only in their area of education, training and experience. It is a professional responsibility for which each professional should be strictly held accountable and liable. The standard is due diligence and care ordinary to the industry. Violators should fairly be subject to the wrath of their registration boards whether an architect or engineer or other professional. Legislation or interpretations which are protectionist of turf between the engineering and architecture does nothing but create a controversy and "in-fighting." The energy would be better spent in focusing upon professionalization within your own professional field.

And that is my opinion.

Kirk N. Nivens, PE & PLS.  
Nivens Engineering, Inc.  
Beaufort, South Carolina

"Utopia is always local."

—Michael Sorkin



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# VIEWPOINT

## Light—The Power to Transform

By James P. Fleming

**L**ight and color are as natural as sound and smell. And it seems that today these and other natural elements are finding a renewed importance in home design with the revival of the concept of the home as a sanctuary.

Natural products like wood, leather, stone, and interior trees and plants often form the basis of interior design programs. Details such as running water fountains, wind chimes, and scented potpourri satisfy the desire for soothing sounds and smells.

Integration of the dynamics of color and light are contributing, too, in a large way, to the overall picture. The wise and creative use of light, through the collaborative efforts of architect, interior designer, and lighting designer, can bring out the maximum design potential of any space. A strategic tool in creating an environment that

evokes a mood or a subtle atmosphere of elegance or drama, lighting has infinite possibilities. The use of colored filters with secondary light sources further enhances the ability to create drama and warmth, transforming the entire feeling or spirit of any interior or exterior.

The lighting industry has been experiencing a rapid development in new lamp technology and in control technology, which, through the creative manipulation of light, now allows a homeowner to be a "conductor" of the home environment. Complete integration of controls on all light sources allows the lowering and layering of light levels to modify and enhance the mood of any space or series of spaces.

On a basic level, it is possible to transform a home or office space through something as simple as upgrading the current light bulbs to various qualities of bulbs that effect a layering of color, shadowing, or texture. For example, most homes have high-bays or recessed cans in the ceiling into which R30 or A19 bulbs originally were installed. By changing to new capsule light halogen bulbs, called Par 30, Par 38, or Par 35, the feeling of those spaces can be transformed. The new lamps allow a fresh, crisp, clean light that brings out the full color of tile, marble, fabric, and other finishes.

Another easy but effective way to enhance a space is to replace wall switches with dimmers. Barely is it desirable to have lighting at full brightness levels. Such illumination can be harsh, cold, and even obtrusive. It also is counterproductive to creating the feeling and mood that your home or other space has the potential to offer. A light source without a dimmer can be compared to a radio without a volume control. The ability to

moderate the level of light is essential.

In the home, updating light bulbs to include the new lamp technology and installing dimmers throughout (that means not just the living room but kitchen, dining room, hallways, bedrooms, bathrooms, and outdoor areas) gives the client the ability to transform spaces. It's important for architects and interior design professionals to be aware of these low-cost ways to achieve high client satisfaction.

Since many Floridians have the luxury of year-round gardens, it is worth mentioning the rich possibilities that exist in landscaping illumination. Landscape lighting is no longer an option but a requirement for new luxury homes. New

products developed in the past decade allow landscape architects to incorporate beautifully effective, low-maintenance, economical outdoor lighting systems.

Because of continuing advances in the industry, there is much that is new and exciting. To save time and mistakes in sorting out what is good and bad (and ugly), most architects and interior designers can benefit from the services of a professional lighting consultant or lighting designer.

*James P. Fleming is President of Lite-Spec & Design Group, Inc., and Vice President, Lighting Designer and Interior Furnishings Buyer/Industry Consultant at Farvey's Design Galleries, Miami.*

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# VIEWPOINT

## Harmonious by Design: Light and the Built Environment

By Robert J. Laughlin

Light has long been considered as fundamental to architecture as form and function. In this century it was Le Corbusier who said, "Architecture is the masterly, correct, and magnificent play of masses brought together in the light..."

In addition to defining a structure's planes and features, light has always played a part in defining its purpose. After all, it was the light in the great cathedrals of Europe that exemplified their spirituality.

Today light retains its importance in the success of any work of architecture. Both its aesthetic and its commercial value are taken seriously, and the industry is flourishing. The work of lighting consultants, too, is gaining recognition, not just in blockbuster projects and sight lighting, but in general commercial projects, such as themed hotels, restaurants and residences, hospitals, shopping centers, factories and showrooms, and every other type of construction.

More and more, architects are realizing that using a lighting consultant can save time and money in many types of projects. The lighting consultant already has done the research—keeping abreast of new technology and energy concepts, and has the tools at hand—a vocabulary of thousands of fixtures from hundreds of sources and the knowledge of what works where. While there is a misconception that using a lighting consultant means added costs and expensive fixtures, more often the reverse is true. For a lighting consultant the goal is achieving the right effect using light, not using expensive fixtures. In fact, the best solution seldom is the most costly.

Finding appropriate fixtures for the project at hand, considering the desired look and effect as well as cost, maintenance, and energy efficiency, is the foremost task. While often an



*The Florida Supreme Court. Restoration by Barnett & Fromholz Architects, Tallahassee, Florida. Lighting designed by Robert J. Laughlin & Associates. Photo: Kathleen McKenzie*

owner or architect may go for the "hottest" or "coolest" new look or technology, the lighting consultant can advise whether these will work to advantage—and if not, what will.

Florida may have more themed architecture than any other place in the world. Recently, themed architecture has spilled out of the theme parks and is affecting virtually every building type. The basis for themed architecture and the associated lighting is a "story line," an overall program—sometimes highly complex to cover all the various elements within a story or theme. The

story line is the lighting consultant's guide for lighting the facility in such a manner that it takes on a particular feeling or character—both interior and exterior.

The first level of lighting should be of an adequate type and character to provide the lighting required for the intended use of the space. Additional lighting should highlight or bring out the character and beauty of the architecture and its forms and spaces. If exposed light fixtures are required, they should complement rather than distract from the architecture. Sometimes custom fixtures are

designed to give a building its own special sense of place, and the architect, of course, contributes to the design process. However, it is often easier and more cost effective to modify existing fixtures. Using standard components has the advantage of saving problems down the road in the form of costly maintenance or hard-to-replace parts. The lighting consultant can choose from a repertoire of thousands of fixtures to accomplish this.

An important element in any lighting scheme is how it will affect the people utilizing the space. Unless patrons look good, they will not feel good, and this may affect their perception of the architecture and its intended use. Lighting has a strong impact on people and their feelings and reactions. Therefore, achieving effective lighting helps achieve the maximum utility of any space. Department store lighting must make people look and feel good or they might not buy. And in a restaurant or grocery store, bad lighting can make even the most beautifully presented food look unappetizing.

An important responsibility of both the lighting consultant and architect is to see that every aspect of their project works together as a whole and does its part to enrich whatever human experience takes place there. The more successful their lighting design is, the more successful their architecture will be.



*Detroit International Airport, Flint, Michigan. Reynolds Smith & Hills Architects, Jacksonville, Florida. Lighting designed by Robert J. Laughlin & Associates. Photo: Neil Roshko*

*Robert J. Laughlin, of Robert J. Laughlin & Associates, Lighting Consultation and Design, Winter Park, is a long-time AIA Professional Affiliate as well as an active member of the Illuminating Engineering Society and International Association of Lighting Designers. Recognition of his work includes several AIA Florida Rouse awards.*

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