

COMBINING  
ENERGY EFFICIENCY  
AND QUALITY DESIGN

A *knowhow*<sup>™</sup>  
CASE STUDY

demonstrating lighting

# URBAN LEAGUE OF GREATER HARTFORD

Staff, volunteers, and potential donors appreciate the fresh airy feeling of the new Urban League building in Hartford, Connecticut. Most importantly, the youths, adults and families seeking assistance there are happy and served well by a skillful lighting design. Local representatives from Northeast Utilities and the Lighting Research Center (LRC) designed the system.

Urban League's new location had to reflect the vitality of the organization itself. The League trains community members for high-tech and other skilled jobs; helps first-time homebuyers; counsels individuals with health and addiction challenges and coordinates public awareness programs. They also run a high school-equivalency program and connect youth with college scholarships.



Careful lighting design considers the tasks performed in each space and provides appropriately balanced light levels. In an area of public service, it minimizes dark areas. Lighting controls add cost-savings, even where efficient light sources are used.

Abundant, diffused lighting with energy-efficient fluorescent lamps illuminate vertical and horizontal surfaces throughout most of the facility. In addition to these, a variety of surface and pendant-mounted fixtures with fluorescent and

compact fluorescent lamps are used. Most offices and common areas have occupancy sensors,



and several classrooms use “daylight harvesting” controls—photocells that dim the lights near the windows on sunny days.

## PROBLEMS OVERCOME

The Urban League's previous facility was smaller and about 30 years out of date. The new four-story facility houses waiting areas, open and private offices, a boardroom, and eight classrooms. Donations financed the renovation, so budgets were extremely tight. The obvious and least-expensive solution would have been a universal layout of 2 by 4 fluorescent troffers.

The inexpensive and “institutional” solution of recessed parabolic troffers is appropriate to many settings. However, the parabolic louvers that prevent glare and channel light downward are not designed to light ceilings or walls, where calendars, artwork, and information are often posted.

In addition to diverse lighting needs, the main challenge of this project was to overcome luminaire mounting restrictions. New HVAC systems allowed only a few inches of recessed space, while ceiling heights were too low to allow traditional pendant-mounted luminaires.



Conference room lights are on dimmers, making them user-friendly during audio-visual presentations.



## LIGHTING QUALITY

In the *Classroom Lighting knowhow™ Series* guide, the DesignLights™ Consortium outlines energy-effective lighting strategies that are conducive to learning. The primary recommendation is for an overall luminous environment, created by lighting the walls and ceiling.

Ceiling-mounted indirect luminaires are relatively new fixture types that allow indirect lighting in low-ceilinged spaces. These luminaires provide uniform light on work surfaces, brighten the ceiling, and make the space look attractive too.

The *Office Lighting knowhow™ Series* guide recommends a similar luminous environment for offices in order to reduce contrasts, shadows, and glare. The most striking aspect of the Urban

League lighting system is the variety of solutions. Surface mounted fluorescent downlights illuminate classrooms; private offices employ an indirect fixture, in addition to task lights on the desks. Compact fluorescent dome fixtures brighten the corridors.

“We tried to address the needs of each space individually. And we’re bouncing light off of the surfaces, rather than having visible lamps,” said LRC designer, Jennifer Brons. “The lighting supports what the Urban League stands for and enhances the environment visually.” An energetic, upbeat atmosphere helps the Urban League staff provide the tools people need to become productive and self-sufficient. “These aren’t people who just sit quietly in their cubicles crunching numbers. They’re reaching out to the community and celebrating its diversity.”

## QUALITY LIGHTING SOLUTION

The ceiling-mounted indirect luminaires recess only 1-inch into the ceiling, and the 7-inch deep diffuser allows plenty of clearance under the 8-foot ceiling space.

In the conference room, the fixtures are on dimmers to accommodate audio-visual presentations; electronic ballasts provide continuous dimming down to 5 percent of light output.

Single-lamp surface mounted parabolics run across the ceilings of the larger classrooms. These fixtures direct light downward for note taking. Most are equipped with energy-saving, high quality ballasts and continuous dimmers.

| QUALITY INDICATORS                            | RATING     |      |           |
|---|------------|------|-----------|
|   | ACCEPTABLE | GOOD | EXCELLENT |
| Control of Direct and Reflected Glare         |            | ✓    |           |
| Light on Walls and Ceilings                   |            |      | ✓         |
| Fixture Location Related to People            |            |      | ✓         |
| Light Patterns and Uniformity                 |            |      | ✓         |
| Daylighting Integration                       |            |      | ✓         |
| Color Rendering and Color Temperature         |            | ✓    |           |
| Lighting Controls and Flexibility             |            | ✓    |           |
| Quantity of Light on Horizontal Surfaces (fc) |            |      | ✓         |



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On sunny days, photocells mounted on the ceiling near the windows signal the ballasts to dim, providing consistent light levels day to day.

Most offices have wall-mounted or ceiling-mounted occupancy sensors that improve the system's efficiency. In private offices, wall-mounted asymmetric indirect fixtures distribute light from T-8 lamps across the ceiling, making the rooms appear bigger. Where needed, ceiling mounted T-8 wall washers illuminate whiteboards and artwork. The ceiling-mounted dome fixtures that light corridors are fitted with twin quad-tube compact fluorescents that backlight the 16-inch diameter acrylic diffusers.

## IMPRESSIONS

"Everybody that comes here is very impressed with this building, and I've got to believe that the lighting has everything to do with it," said Rev. Ben Dowdell, director of office operations.

He explained how the lighting influences people's attitudes: clients, staff, volunteers, and donors, "The way the lighting hits the walls make it a very bright building. On a gloomy day it seems like there's no sun outside, but the sun's in here—it's beautiful!"

With large numbers of staff and volunteers coming and going through its doors, Dowdell adds, "When people come here they don't want to leave." Compared to the old facility, the difference is "night and day."

## AND NOW THE NUMBERS

At an average of 38 footcandles, illumination levels within the open office spaces slightly exceed recommendations of the Illuminating Engineering Society of North America. Illuminances in classroom spaces range from 38-46 footcandles on desktops. Connected load is reduced from 1.2 watts in the original design to 0.97 watts per square foot realizing satisfactory energy savings.



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### COSTS

|                                    |           |
|------------------------------------|-----------|
| Total fixtures and lamps           | \$127,000 |
| Total installation labor           | \$25,000  |
| Installed system cost              | \$152,000 |
| Materials per square foot          | \$4.18    |
| Installation labor per square foot | \$0.82    |
| Total cost per square foot         | \$5.00    |

### SAVINGS

|  |           |
|--|-----------|
| Demand reduction <sup>2</sup>            | 7 KW      |
| Watts saved per square foot              | 0.23 W/SF |
| Annual utility cost savings <sup>1</sup> | \$2,184   |

<sup>1</sup>Based on 3,120 hours per year usage and local utility rate of \$0.10 per kilowatt-hour.



## PROJECT SUMMARY



|                                |   |
|--------------------------------|---|
| <b>Utility:</b>                | Connecticut Light and Power Company   |
| <b>Utility Representative:</b> | Richard Chasse  |
| <b>Customer:</b>               | Urban League of Greater Hartford  |
| <b>Facility:</b>               | Urban League of Greater Hartford  |
| <b>Location:</b>               | Hartford, Connecticut   |
| <b>Space:</b>                  | Offices and Classrooms  |
| <b>Area:</b>                   | 30,400 square feet  |
| <b>Ceiling Height:</b>         | 8-8½ feet   |
| <b>Fixtures Used:</b>          | Focal Point Mounted Gullwing with two T-8 lamps, Columbia S6 continuous row of single-lamp parabolic downlights, Lightolier ceiling mounted 16-inch Spill Ring acrylic-domed diffuser, Lightolier Bi-Lyter T-bar mounted wallwasher |
| <b>Light Levels Achieved:</b>  | Average of 35 footcandles on horizontal work surfaces   |
| <b>Lighting Power Density:</b> | 0.97 watts per square foot  |
| <b>Architect:</b>              | Tecton Architects PC  |
| <b>Engineer:</b>               | DLB Associates  |
| <b>Lighting Specifier:</b>     | Lighting Research Center, Rensselaer Polytechnic Institute  |
| <b>Installing Contractor:</b>  | Anderson Electrical Contractors   |

## THE LIGHTING KNOWHOW™ SERIES

The DesignLights™ Consortium publishes the *knowhow™ Series* for office, small retail, classroom and industrial/warehouse lighting. This *demonstrating lighting knowhow™ Case Study* highlights a specific installation of lighting that showcases quality, comfort and efficient use of energy. With members located throughout the Northeast and the Mid-Atlantic, the DesignLights™ Consortium is “a regional collaboration seeking to influence naturally occurring lighting events towards quality, comfort and efficiency.” The DLC includes among its members many electric utilities as active participants, as well as several other interested stakeholders. The DLC created these case studies with the intention of helping contractors and lighting specialists sell and deliver the benefits of high quality, energy efficient lighting to their customers in the commercial building market.

### Efficiency Vermont

#### Long Island Power Authority

#### National Grid

- Massachusetts Electric
- Narragansett Electric
- Granite State Electric
- Nantucket Electric

#### Northeast Energy Efficiency Partnerships, Inc.

### Northeast Utilities

- The Connecticut Light and Power Company
- Western Massachusetts Electric Company

#### New York State Energy Research and Development Authority

#### NStar Electric

#### United Illuminating Company

#### Unitil

- Fitchburg Gas and Electric Light Company



Prepared by Weller & Michal Architects Inc. with WV Engineering Associates PA.  
Technical writing by Lois I. Hutchinson. Photography by George Leisey. Graphic Design by Braden Printing, Inc.

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