

SMALL COMMERCIAL LIGHTING PROGRAM — CASE STUDY

Project Profile

Type of Space

Library

Square Footage

1392

Project Objective

Provide uniform lighting while reducing maintenance and energy costs

Project Benefits

Easier to see and read
Lower utility bills
Low maintenance costs

A prominent historical building in Rensselaer County, the Berlin Free Library, embarked on an expansion project to accommodate its growing collection of books and increasing number of patrons. The dim, uneven, and flickering lighting in the existing space led library planners to call for new approaches that would provide better quality lighting and also add to the aesthetics of the new addition. Since the library is publicly funded, the planners were also conscious of the need to control operating and maintenance costs.

David Theriault, the builder selected for the new section, contacted Karl Pedersen of Wolberg Electric Supply and Ken Latal of Lumen Power Sources, both Allies in the New York Energy SmartSM Small Commercial Lighting Program. Working together, they designed a lighting system that offered an aesthetically pleasing and visually comfortable environment for staff and patrons while reducing energy costs.

Lighting design for the book stack areas of a library can be a challenge because uniform and adequate illumination must be provided on two planes. To accomplish this, 17 two-lamp, T-8 direct/indirect fixtures (providing 20% uplight and 80% downlight) were hung from the ceiling over the stacks in strategic positions to provide even lighting. Aircraft cable was used to hang the fixtures at a uniform height above the stacks, accommodating the sloping ceiling. The fixtures incorporate a white finish on the lower optics, resulting in little or no glare. Flicker is



Direct/indirect fixtures provide even vertical and horizontal lighting for the book stacks.

eliminated by using the T-8 lamps and electronic ballasts. The use of high-color rendering “800” series lamps enhances the attractiveness of the space by emphasizing the colors of the walls, furniture, and book covers.

The Library’s new upstairs reading loft requires more light than the book stack area. Here, three-lamp, T-8 direct/indirect fixtures were used. The combination of uplight and downlight reduces shadows by providing even lighting throughout the space, and the resulting 50 footcandles of illumination on the reading table is appropriate for the task.

The expansion also included new private office space, where the same style two-lamp direct/indirect fixtures were used. These fixtures incorporate dimmable ballasts to allow staff to raise or lower lighting levels depending on the task being performed. For instance, light levels can be lowered while doing computer work, or raised for other tasks.

Windows provide plenty of light to the work area on a sunny day. Daylighting is complemented by six-lamp, 42-watt compact fluorescent pendant-mounted indirect dome lights that bounce light off the ceiling. While providing a visually attractive focal point, they are also functional, providing illumination in the evening and on cloudy days. A compact fluorescent wall sconce was added in one corner to balance the light coming in through the windows.



Natural daylight and direct/indirect fixtures light the reading area.

Tech Specs

- Low-glare, pendant mounted dome fixtures with six 42-watt compact fluorescent lamps
- Direct/indirect two-lamp and three-lamp T-8 fixtures with electronic ballasts
- High color rendering “800” series linear fluorescent lamps
- Manual dimming control in the private office
- 1.25 installed watts per square foot after allowance for dimming control
- Estimated wattage saved compared to standard system: 1,971 kWh per year
- Estimated energy savings compared to standard system: \$168 per year



Pendant mounted compact fluorescent fixtures light the work area.

Lighting system maintenance costs for the Library will be minimal based on the 20,000-hour average rated life of the T-8 linear fluorescent lamps and the 10,000-hour compact fluorescent lamps. By using two-lamp fixtures in most areas and using three-lamp fixtures only in the critical reading area, energy costs will be kept low. The 32-watt “800” series linear fluorescent lamps used in the fixtures not only produce more accurate color rendition than the standard “700” series, but they further contribute to reduced energy costs by producing more light output using the same amount of energy. This can reduce the number of fixtures needed in a given area.

The Bottom Line

The fixtures selected are readily available from most lighting suppliers and will qualify for an additional \$200 in cash incentives from the **New York Energy SmartSM** Smart Equipment Choices Program. Taking that incentive into account, the cost of materials was reduced to just \$3.45 per square foot. In addition to the low operating cost, the Library has all the other benefits from the system they wanted including proper light levels, comfortable atmosphere for the patrons and staff, no flicker, and even illumination. Additional energy cost savings will be realized from the manual dimming control in the private office area.

For More Information

The New York State Energy Research and Development Authority (NYSERDA) offers businesses energy-saving opportunities through the **New York Energy SmartSM** Small Commercial Lighting Program. Additional programs can help businesses reduce utility costs, including the **New York Energy SmartSM** Smart Equipment Choices Program, which offers financial incentives to businesses for energy-efficient lighting equipment and a variety of other electric-efficiency measures. To learn more about these incentives and to make your lighting more effective and efficient, visit www.nysERDA.org/scslp or call toll-free 1-866-NYSERDA (1-866-697-3732).

“These lights don’t even feel like fluorescent to me, there isn’t the glaring brightness I usually associate with fluorescent lights. Nowhere is there a problem seeing titles because the lighting is so even.”

— Sharon Vogel, Director