

# A Lighting Conversion Case Study

UEA PUBLICATION FORUM / VOL. 12 FALL 1992

## Laurens County Schools No 56 Clinton, South Carolina

***“Maintaining light levels and obtaining a reasonable return on investment were our main priorities.”***

### ***Description:***

The Laurens County School System consisted of seven schools, containing a total 3,339 fixtures requiring conversion. The schools operated five days a week, requiring approximately 40 hours of lighting. However, because the facilities are used only nine months out of the year, the average annual hours per week was less than 28. The average KWH rate was .046 cents and air conditioning was utilized 5 months out of the year. The primary fixtures targeted for conversion were 3,069 2x4 lay-in recessed troffers. These fixtures were equipped with four 40W lamps and two 16W ballasts.

### ***Retrofit Goals:***

The County wished to maximize watt reduction, yet meet NAIE recommended standard of 50

foot candles at desk top level in the class rooms. In some areas this actually required increasing measurable light.

### ***Constraints:***

The goal of increasing light quality represents a constraint on maximizing watt reduction, as did the client's insistence that light levels be maintained or increased. Other constraints were generally logistical with access to various buildings being limited and supervised.

### ***Solutions:***

The four existing 40W lamps were removed from each fixture and properly disposed of. One ballast in each fixture was disconnected and tied off. Sockets were recentered where appropriate. In 2,253 of the fixtures, used in class rooms and offices, CAD specified Alcoa Everbrite reflectors were mounted. Then two Philip's T-10 Advantage X 5000K lamps were inserted in each fixture. In addition, the fixture housings were cleaned as part of the total installation.

### ***Results:***

Watt draws were reduced by 50 percent. Light levels increased approximately 10 percent where fixtures were converted using reflector units. In the fixtures that were downlamped without using reflectors, light levels were uniformly maintained.

### ***Explanation:***

The Philip's lamp chosen for this project produces considerably more light than standard fluorescents. The reflector greatly increases the fixture's efficiency (i.e., its ability to get the light out of the fixture and down to the work space.) The combination of these factors explains the increased light levels. Standard lamps rate a 60 on the *Color Rendering Index* and Cool-White color temperature is 4100 Kelvin. The Philips T-10 develops an 80 CRI and a color temperature of 5000K. This particular combination optimizes human visibility and perceived brightness, which explains the dramatic quality increase. Watt

draw of the fixtures was reduced 50 percent because the electrical components were reduced by half. A fixture which formerly utilized 4 lamps and 2 ballasts now utilizes 2 lamps and a single ballast, yet brings more and better quality light into the work place.

### ***Financial Facts:***

This retrofit conversion produces a projected annual cash savings over \$33,700. This is a annual savings per fixture of over \$10.00. This produces a 30 percent annual return on investment and a pay-back period of approximately 3 years.

### ***Environmental:***

This project eliminates the burning of over 215 tons of coal or 990 barrels of oil, thereby avoiding the emission of over 1,169,000 lb.. of carbon dioxide and 15,000 lb.. of sulfur dioxide.

Contact: Mr. Lee Templeton  
Director of Maintenance  
Laurens County,  
P.O. Drawer 484  
Clinton, SC 29325