

A Lighting Conversion Case Study

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Hardees Restaurant Kissimmee, Florida

"I had always thought that lighting was such a small part of our overall utility costs that converting it would generate very little savings — Not!"

Description:

Because of its location, close to Disney World and other attractions, the Hardees Restaurant in Kissimmee, Florida, is one of the most successful fast food operations in the Orlando Area. However, the owner and manager, Jerry Bordeleau, takes greatest pride in his local customers who make up an exceptionally strong repeat business. The restaurant operates 24 hours a day, seven days a week and air conditioning is utilized 12 months per year. The light fixtures targeted for conversion were (33) 2x4 lay-in recessed troffer equipped with four 40W lamps and two 16W ballast, (16) 2x2 lay-in recessed troffers equipped with two 40W U-Bent lamps and one 16W ballast and (36) recessed and track fixtures, each utilizing

60W incandescent lamps. The total fixture count was 85.

Retrofit Goals:

Because the utilities furnished to the restaurant are provided by the locally owned Kissimmee Utility Authority (one of the highest rates in Florida), the owner's primary goal was to reduce consumption as much as possible while at the same time maintaining light levels and improving visual acuity within the restaurant.

Constraints:

The goal of increasing light quality represents a constraint on maximizing watt reduction. In addition, because of the store's high volume of business, all work had to be performed in the early morning hours. There were no budget constraints, but under the circumstances (24 hour operation and high utility cost) it was felt that a reasonable overall objective was to achieve a total payback of investment in one year or less.

Solutions:

The four 40W lamps were removed from the 2x4 fixtures and properly re-cycled. One ballast was disconnected and tied off. Sockets were re-centered where appropriate and CAD specified Alcoa

Everbrite reflectors were mounted. Two Philips T-10 lamps were inserted in each fixture. The two U-Bent 40W lamps and one 16W ballast were removed from the 2x2 fixtures and a new 8W ballast was installed and covered by a CAD designed four-piece Everbrite reflector set. New tombstones were recentered and the fixtures were fitted with two Philips Ultralume 20W lamps. The fixture housings of both the 2x4 and 2x2 fixtures were cleaned as part of the installation. Lastly, the 60W incandescent lamps, in the recessed and track fixtures, were replaced with 15W Panasonic light capsules (PLs).

Results:

Watt draw was reduced in the 2x4 fixtures from 192 watts per fixture to 96, and in the 2x2 fixtures from 96 to 48 watts. Proportionally the greatest savings came from the PL conversion which reduced the fixtures involved from a consumption of 60 watts to 15. Light levels were uniformly increased and the quality of the light dramatically improved.

Explanation:

The reflectors greatly enhanced the fixtures efficiency, directing more of the light output to the work place. Both the Philip's T-10 and Ul-

tralume lamps produce considerably more light than standard fluorescents. The combination of these factors enabled the fixtures to deliver more light to the work place, with only one-half of the energy formerly required.

Financial Facts:

Turn-key cost of conversion was \$3,762 or \$44.26 per fixture. The \$520 per month saving generated from this conversion will "payback" the investment in less than eight months, after which time it will provide an additional income to the restaurant of over \$6,200 per year or over \$70,000 in ten years. Maintenance savings are very significant as well. There are now half as many lamps and ballast in the system to maintain, plus the existing ballast inventory will provide savings for many years to come.

Environmental:

This project eliminates the burning of 24 tons of coal or 109 barrels of oil, thereby avoiding the emission of 129,179 lb. of carbon dioxide and 1,671 lb. of sulfur dioxide.

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