

Snapshots

OUTDOOR ENTRY LIGHTING

Demonstration and Evaluation of Lighting Technologies and Applications ▲ Lighting Case Studies

Most homes have an outdoor luminaire near the entrance for safety, security, and decoration. Carefully selected and located outdoor luminaires can reduce energy use, improve lighting quality, and increase a sense of security.

Application Profile

This row house is one of many in a historic neighborhood in Albany, New York. The low-income neighborhood is generally safe, although a mugger, hidden in the recess between the wall and front door in a nearby building, recently assaulted a tenant. The homeowner worries about people hiding in his own entry recesses when he returns home at night.

The streetlights illuminate the steps (about 2 footcandles [fc]). A glaring, clear glass globe luminaire with a 100-W incandescent lamp was located on the short ceiling between the decorative lintel and the front door transom (see reverse page). The clear globe was usually left on all night for security. However, the recesses still appeared dark.

In 2000, DELTA replaced the ceiling-mounted luminaire with a motion sensor and installed ENERGY STAR®-labeled decorative luminaires each with an 18-W compact fluorescent lamp on the wall in each recess flanking the front door.

Lighting Objectives

- Eliminate dark areas on the entry stoop
- Make it easier to see the lock at night
- Reduce glare
- Light the entry at dusk without leaving lights on all day
- Reduce energy use



Money Isn't All You're Saving

What is the ENERGY STAR® program?

The U.S. Environmental Protection Agency and the U.S. Department of Energy have initiated a program to encourage the use of energy efficient appliances and products. Manufacturers that join the program with products that meet the ENERGY STAR® performance criteria can label these products ENERGY STAR® luminaires. See the ENERGY STAR® web page for more information. <http://www.energystar.gov/products/>



Residence Entry
Albany, NY

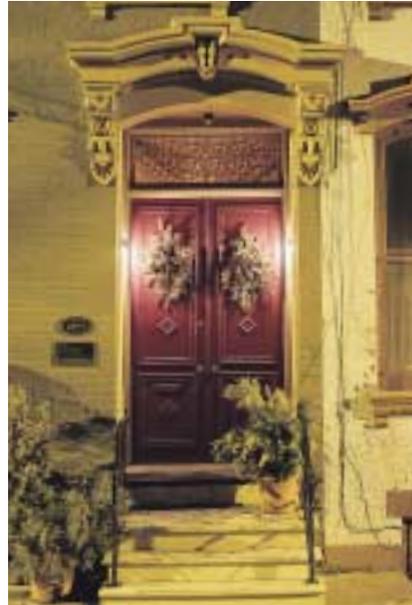
Lighting Quality and Security

The two luminaires increased the illuminance on the recessed walls from 1 to 5 fc (see reverse page) and the illuminance at the lock from 1 to 3 fc. The homeowner is pleased with his ability to see the steps and people approaching the front door. These luminaires provide the same illuminance on the steps as the globe they replaced; yet, since their white glass diffusers have only one-sixth of the luminance of the clear globe, glare is noticeably reduced. Visitors are easier to identify from inside the home because this bilateral lighting design reduces shadows on the face.

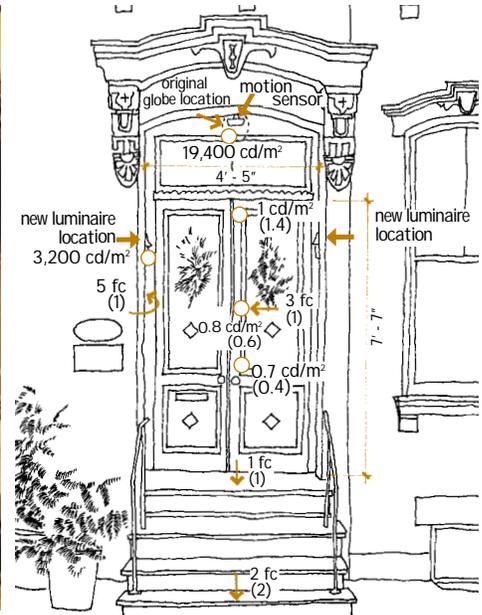
ENERGY STAR®-labeled outdoor luminaires have integrated photocells that switch the lights off automatically when there is sufficient daylight. The motion sensor turns on the light at night automatically when someone approaches the home. These two features allow the homeowner to leave the light switch on when he goes to work, but the luminaires stay off unless someone approaches the door at night. The homeowner avoids wasting energy and enjoys having the lights on when he returns from work in the evening. This also increases his sense of security when he is at home at night, because the lights go on if anyone approaches the door. This may discourage potential intruders.



Before retrofit



After retrofit



Photometric values measured at night with streetlights on. (Values in parentheses show previous condition.)

Luminaire Performance

When the luminaires were first installed, the homeowner reported premature failures of the compact fluorescent lamps. The lamps were rapidly cycling on and off because the photosensor switched the lamps on at night, but then detected sufficient light from the lamps to switch them off again. Rapid switching of fluorescent lamps shortens lamp life. Luminaires with improved photosensor design were installed and are operating satisfactorily.

The owner also noticed that at dusk one luminaire turns on as much as 15 minutes after the other one. It is possible that the location of the luminaires affect the amount of daylight arriving at each photocell. In addition, the photocells may have different sensitivity thresholds causing the lamps to turn on at different light levels.

Energy and Maintenance

Compared to the original entry lighting, the compact fluorescent lamps reduce the required power due to their higher efficacy (70 lumens/watt). The photosensors and motion sensor reduce the hours that the lights are on. DELTA estimates that each year this design will consume 280 kWh less than the clear globe, saving the homeowner about \$30 on his annual electric bill.

Because the motion sensor may switch them frequently, the compact fluorescent lamps may not achieve their rated life of 10,000 hours. However, DELTA estimates that they may last twelve times longer than the 750 hour-rated incandescent lamps.

DELTA Snapshots

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