

# A Lighting & Water Conversion Case Study

UEA PUBLICATION FORUM/VOL 176 – SPRING 2001

## Serene Manor Medical Center Knoxville, Tennessee

**“Energy savings provided much of the motivation to do this project, but the overall improvement in the facility’s lighting was a wonderful plus.”**

### **Description:**

Serene Manor Medical Center is a 79 bed full service nursing facility that operates today at a consistent 99 percent occupancy.

Founded in 1959, the Center occupies a building constructed in 1936 on a section of the old Knoxville General Hospital site. Serene Manor truly occupies a part of Knoxville’s history.

The facility employs an average of 75 employees. It offers round the clock licensed nursing care as well as full housekeeping and dietary services.

### **Goals:**

The building contained 266 light fixtures. Excellent energy savings were available through renovation.

In addition, Serene Manor contained 19 Sloan Flushometer toilets and bathroom sinks, which could be renovated to effect considerable savings of water/sewer costs.

The goal for both the lighting and water renovation was to save the maximum amount of energy possible, while maintaining or improving the quality of light and the efficiency of the plumbing fixtures.

### **Solutions:**

Of the 266 light fixtures contained in the building, 120 utilized standard electro-magnetic ballasts and fluorescent T-12 lamps. These fixtures were converted to electronic ballast and T-8 lamps. In addition, 25 exit signs, using various high wattage incandescent light sources, were converted to LED’s; 121 fixtures utilizing standard incandescent lamps were converted to high light output fluorescent replacements.

### **Components:**

UEA’s specification for this project was followed precisely. All hardware, including lamps, ballast, lamp sockets and end brackets were removed from the existing fixtures and replaced with new components.

The replacement ballasts used in this project were both, parallel wired and rapid start to eliminate emergency maintenance problems and to extend lamp life.

The T-8 lamps used in this conversion were all

triphosphored and provided improved levels of CRI as well as much higher lumen per watt output than the T-12 lamps they replaced. All new lamps were full spectrum (85 CRI) and low mercury rated to eliminate disposal costs downstream.

The reflector kits used were custom fabricated from Alcoa “Everbrite” lighting sheet.

The Sloan Flushometer toilets were renovated, using HydroEnhanced Laboratories, Inc. (HLI) conversion kits, to use a gallon less water with each flush.

In addition, all bathroom sinks were fitted with HLI moderators to reduce water flow to ½ GPM.

### **Results:**

This renovation produces an annual Return On Investment (ROI) of over 53.6% and will save Serene Manor over \$88,800 over the next ten years! The combination of electronic ballast and T-8 lamps resulted in lowering the average required fixture input watts 40 to 60 percent. In addition to adding to the overall appearance of the building and enhancing its visual acuity, the renovation reduced the building’s total monthly lighting KWH by over 63,000 KWH and the KWD by over 10 KWD. Based on Serene Manor’s current rate of .065 per

KWH, this renovation will save the company over \$7,900 annually and pay back the entire retrofit investment cost in less than 2 and a half years.

Because of this high Return On Investment, Serene Manor was able to qualify for a special State of Tennessee Environmental Loan Program that allowed all renovation costs to be financed over 7 years at an interest rate of only 3 percent!

### **Environmental:**

This project eliminates the annual emission of over 95,000 pounds of CO2 into the atmosphere.

All removed lamps and those ballasts containing the hazardous waste, PCB, were properly disposed of through a licensed hazardous waste disposal contractor. A certificate of destruction was presented to Serene Manor, thus relieving the company of any and all liability. United Energy Associates, Inc. is an EPA Energy Star Buildings Ally.



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