



Maintenance Strategy – Lighting Systems

This category covers a broad range of a buildings lighting systems and sub systems. The information contained in this document are general recommendations and guidelines designed to bring attention to the importance and benefits of preventive maintenance strategies supporting quality educational environments. It is important for facility managers and maintenance staff to be aware of the specific systems asset types and maintenance required to effectively maintain the systems functionality and reliability through preventive maintenance requirements. Qualified in-house maintenance combined with certified vendor staff may be necessary to manage systems safely and effectively. Consult manufacturer recommendations on building lighting system maintenance requirements.

There is one constant in business: change comes in multiple dimensions. Your facilities maintenance needs are no exception. As building lighting systems undergo the process of constant use conditions begin to wear and break-down due to heavy use over time. School lighting systems are an important facet to the overall safety and security of exterior areas and critical to the learning environment.

A schools lighting system should provide adequate light for the task at hand (interior versus exterior, classroom versus gymnasium) at an effective cost. And that performance should continue over time. An effective lighting maintenance program can significantly increase lighting system efficiency; however, without such a program, a lighting system could deteriorate quickly. Dirt, lamp depreciation, electrical issues and burnouts that are not promptly managed can combine to the point where your lighting system delivers as little as one-half the original light output.

As a first line of defense, all lighting systems and components require routine cleaning and manufacturer recommended maintenance to ensure quality output supporting the educational environment. When lighting fixtures are cleaned and re-lamped regularly through an effective preventive maintenance program, light output can be increased by as much as 25 to 30 percent. When energy-reduction steps are taken that would otherwise lower light output, group re-lamping and cleaning often more than compensate for the planned reduction.

MAINTENANCE AND REPAIR. Without routine scheduled maintenance a lighting systems reliability ultimately deteriorates before it is time. Preventive maintenance means the early detection and repair of minor defects, before major reactive action is necessary; it is a proper way to care for a school lighting systems. Lighting Systems, both inside and outside should be routinely reviewed for proper operations to include cleaning to remove dirt and debris affecting the schools appeal, conducting minor repairs to fixtures and proper upkeep supporting a safe and functional asset. Other factors to consider supporting a quality lighting program include:

- **Using correct replacement lamps.** While all four-foot fluorescent tubes might look alike, they can have different performance characteristics.
- **Cleaning fixtures annually.** A fixture's output can diminish by 10 percent a year just from dust accumulation, even in a relatively clean environment.
- **Verifying other replacement components match the original.** New ballasts, transformers and drivers should have the same performance characteristics.
- **Ensuring all ballasts have a published ballast factor.** Maintenance and engineering managers can use it as a multiplier to determine whether a lamp actually will produce the predicted amount of light.

Cleaning fixtures: Significant light losses will result from dirt accumulating on lamps, reflectors, and covers if regular cleaning is not done. While cleaner conditions support efficiencies, there is still potential for lighting systems to deteriorate over time. In dirtier environments, deterioration and light loss is greater. It is important to clean the systems on a scheduled basis. If a unit's housing has become rusted or considerable dirt is noted, it should be considered for replacement. Implementing routine cleaning processes of lighting systems will often increase existing light levels. - It is important to clean the lens, louvers, sockets, and even the fixture. If the troffer housing has become rusted or dirt is baked on, making the fixture too hard to clean, it should be considered for replacement. Cleaning is usually needed no more often than once a year, but frequencies should be monitored for effectiveness.

Re-lamping: Preventive Maintenance of lighting systems including group re-lamping can reduce labor costs. (Spot re-lamping is the replacement of individual lamps when they burn out.) The time needed for someone to replace a single lamp includes the time a maintenance worker spends determining which particular lamp is to be replaced, getting the new lamp, placing the ladder, opening the fixture, replacing the lamp (and hopefully cleaning the fixture), returning the ladder, and disposing of the old lamp. This time is much greater than the time involved for replacing each lamp in an organized replacement of all lamps at once. As relamping is often done at nights and on weekends, when higher hourly wages are paid, the ability to reduce the number of times each fixture must be serviced should be considered as part of the cost-savings process.

Implementing a Lighting Maintenance Program: Either building personnel or a lighting maintenance contractor can implement a lighting maintenance program. Lighting maintenance contractors can also help develop a plan for a property's lighting systems that will upgrade light output and appearance and eliminate any need for attention from building maintenance personnel.

Lighting Controls: Proper maintenance is almost always the front-line defense against unnecessary energy costs. But there are other proven methods for realizing cost reductions such as lighting controls.

In the past, lighting controls had been used mostly to provide lighting flexibility or dramatic lighting effects in office spaces. Today, their primary function is energy management. Simple controls such as photocells, time clocks, or motion sensors automatically turn lights on when they are needed and off when they are not needed. For larger facilities, control systems can be designed to integrate lighting into other building automation systems, such as those used to control heating and cooling.

Wall Switches and Motion Detectors: The simplest approach to saving energy is to turn off the lights when an area is not occupied. Workers can be educated to do this manually with a wall switch, or it may be automatic, activated by a motion detector mounted on the ceiling or on the wall to replace the wall switch. Various types of sensors are available; motion detectors may use infrared sensors, ultrasonic sensors, or both. Because a sensor must be able to 'see' most of the room to be effective, placement of sensing devices is critical. Motion-detector-activated light switches should be considered in private offices, conference rooms, file rooms, restrooms, and some general office areas to turn off lighting automatically when these areas are not occupied.

Inspection and Evaluation - A key to successful maintenance is careful planning and programming of the work to be done. The first step in planning is developing a periodic evaluation of lighting systems that are currently installed.

Maintenance Recommendations: Lighting Systems should be in good physical condition with evidence that components are routinely cleaned and maintained. Dust and debris should be routinely cleaned from interior plastic covers. Lighting systems to include bulbs, covers, fixtures, switches should be installed correctly and in a working condition. Exterior lighting should also be reviewed regularly to ensure components are clean and working as designed to provide for the necessary lighting for the associated tasks (security, parking, etc). Graffiti or vandalism on these systems should be removed in a timely manner and timely repairs made to ensure a working system. Safety, risk hazards or physical property damage should be mitigated to prevent damage or risks.