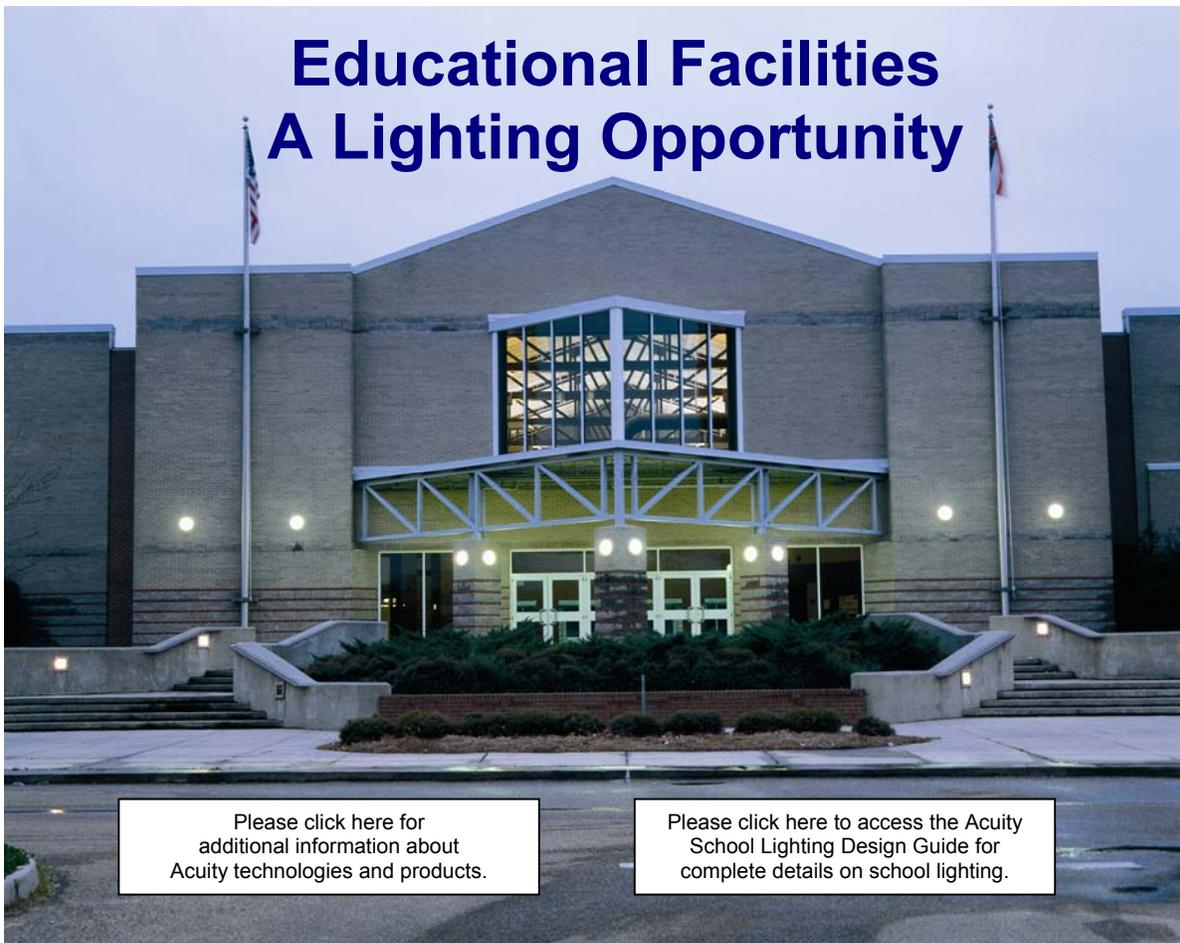


## Lighting for Energy Savings, Safety and Security



## Educational Facilities A Lighting Opportunity



Please click here for additional information about Acuity technologies and products.

Please click here to access the Acuity School Lighting Design Guide for complete details on school lighting.

Recommended lighting levels within this document are from the IESNA Lighting Handbook, 9<sup>th</sup> Edition, 2000. Factors such as age, speed, accuracy and contrast may affect such levels. Consult the handbook for details.

Business Partner



## Table of Contents

There exists today a wide variety of lighting fixtures designed to address the many lighting needs of an educational facility. These include fluorescent, HID and emergency equipment. This guide is available to assist you in selecting fixtures that are energy efficient and meet the high performance and varied needs found in typical school settings.

Whether as new construction or for renovation, schools provide a wide range of applications where seeing and the associated lighting are critical. From the classroom where proper lighting can have a positive impact on learning to the parking lot where safety and security become the issues.

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# Indoor Applications

## Classrooms

**Classrooms** are one of the most challenging designs in today's educational facility. Since many schools offer adult learning courses in the evening, classrooms must provide for a wide range of teaching activities that change throughout the day. They must be energy-efficient and comply with strict state codes for lighting power density, LPD (watts per square foot). The ASHRAE/IESNA Standard 90.1R limit is 1.5 watts/square foot for classrooms.



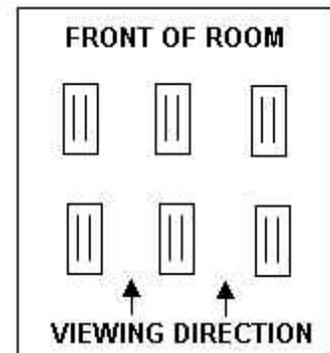
The use of multi-media equipment and personal computers also presents new challenges for today's lighting design. Multi-level switching should be integrated with the electrical system to accommodate different lighting requirements throughout the day.

The following are typical footcandle levels found in classrooms across the country. Many states have their own footcandle requirements, so be sure to check local codes.

Activity	Footcandles	Lux
Handwritten task	50	500
Printed tasks	50	500
Chalk boards	50	500

The orientation of the luminaires in the classroom is also important. The primary viewing direction of the students should be along the side of the luminaire with lower brightness--for most products, this means the lamps will be parallel to the line of sight.

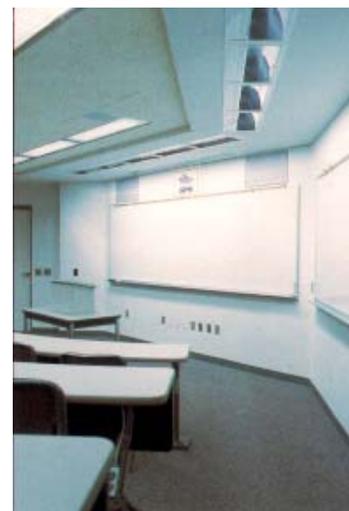
**General Lighting** -- Luminaires that provide high efficiency, uniform illumination and low glare are desirable in classrooms. Many states have codes that regulate uniformity ratios and VCP's (Visual Comfort Probability), and it is common to see a 2:1 uniformity ratio (within any four foot distance from one another) and a minimum VCP of 70 specified. [Louvered products](#) are excellent choices for classrooms due to their low glare and high VCP. A [recessed direct/indirect](#) luminaire also provides excellent uniformity and high vertical illumination while at the same time is visually comfortable. A more economical product choice is the recessed [lensed troffer](#). These products should be specified with low-glare lenses.



**Perimeter Lighting / Wall Washing** -- Perimeter lighting is necessary to achieve a more uniform luminance, a better "brightness balance" and results in a more pleasing environment. Illuminated walls also help make the space appear larger and eliminates the cave-effect (dark ceilings or walls) that can result when using luminaires with low cut-off angles such as small-cell louver products and deep cell parabolics. In addition, [wall wash](#) luminaires accent artwork, charts, maps or other wall mounted displays. Choose products with an asymmetric distribution. Another good choice is [recessed downlights](#) with wall wash distributions. Luminaires should be mounted 2 to 3 feet from the wall to provide proper uniformity.

**White Board Lighting** -- The White Board is rapidly replacing the chalk board in schools across the country. The IESNA recommends about 50 footcandles on the vertical surface of the board, thus requiring special luminaires that direct a high concentration of light in one direction. Care should be taken to reduce veiling reflections that are frequent on shiny surfaces.

**Classrooms with Computers** -- Computers are being used more frequently in classroom applications, and special lighting products should be chosen that eliminate a bright reflected image of the luminaire from the computer monitor.



Small-cell louvered products can also be used in computer applications. These luminaires reduce reflected glare from computer screens but are not as energy efficient as large-cell louvers. Aluminum and plastic small-cell louvers are available; however, aluminum louvers may be preferred since they are easier to clean and maintain.

Windows should be properly shielded, since bright sunlight can wash out a computer screen. 3 footcandles are recommended for viewing computer screens, and 30 footcandles are recommended for keyboards; therefore, multi-level switching or dimming can be utilized to reduce the overhead lighting and increase the visibility of the computer screens.

**Renovations** -- Many times schools that are being renovated are characterized by high ceilings made of sheetrock or similar materials and are not conducive to recessed lighting. In these cases, [surface-mounted wraps](#) are recommended.



**Vandal Resistance** -- Classrooms can be the target of vandalism, abuse or tampering. Some products feature heavy-duty lenses and tamper-resistant fasteners to enclose the luminaire and protect the lamps inside.

**Daylighting** -- Windows and skylights provide visual relief for tired eyes by allowing students to focus on distant objects and relax eye muscles. Daylight also provides sensory stimulation and improves psychological well-being. Window sizes in classrooms can range from a small vision strip to a full floor-to-ceiling window wall. Windows should be located at the side of the room and not the front or the rear in order to reduce glare, and they should have treatments such as curtains, louvers or blinds to provide light control. Special [lighting controls](#) take advantage of the available daylight and adjust the lighting levels accordingly and are an excellent way to reduce energy costs.

**Multi-Media** -- Many times, videos, slides and computer projections are used to enhance instructional learning in the classroom. In these cases, the luminaires above the screens should be switched separately to prevent washing out the screen. The other luminaires in the room should be dimmed or designed for bi-level switching to reduce the ambient lighting adequately. The room should not be completely dark, since many times students are taking notes and need sufficient light to see their writing. Make sure pendant-mounted luminaires do not interfere with projection and audio visual equipment.

**Energy Efficiency** -- Fluorescent lighting is more energy-efficient than incandescent lighting and is available in a variety of color temperatures and sizes. The T8 lamp is an excellent source for energy efficiency and optimum color rendering. Compact fluorescent lamps are also energy efficient and offer high lumen output. The electronic ballast should be chosen to provide further energy savings, superior dimming control and quiet operation.

## Administrative Offices

Administrative Offices in a school should be illuminated with low-glare, energy-efficient lighting products. **Most reading tasks require 50 footcandles of illumination.** Offices are often designed with [parabolic louvers](#) or [recessed direct/indirect](#) luminaires. [Lensed troffers](#) supplied with low-glare lenses are also appropriate when computers are not prevalent. If computers are being used, parabolic lighting or suspended direct/indirect lighting provides a comfortable seeing environment without distracting glare on the computer screen (suspended products may be specified with dust covers to prevent debris from entering the luminaire).



If partitions or cubicles with overhead shelves and storage cabinets are used, [task lighting](#) can be specified to increase the lighting levels on the desk top.

Reception areas and conference rooms are good applications for downlights and [wallwash](#) products to highlight plaques or photographs mounted on the walls. [Dimming control systems](#) or wallbox dimmers are recommended in conference rooms to adjust the lighting levels for meetings and audiovisual presentations.

Surface-mounted products such as wraparounds are available when there is limited access above the ceiling.

If windows or skylights are present, special [lighting controls](#) that take advantage of the available daylight and adjust the lighting levels accordingly are an excellent way to reduce energy costs.

## Hallways

Hallways serve many purposes. They allow student to pass safely to and from classes, they contain student lockers, and the walls are often used to display awards, posters and trophies. A well lit corridor provides for a safe and orderly environment. In some schools today, security cameras, which require a well lit space, can be found along the corridors.



**The suggested horizontal illumination is 30 footcandles and the suggested vertical illumination is between 15-30 footcandles.** This will ensure the students have enough light to view the books in their lockers. Luminaires, such as the [recessed direct/indirect](#), that provide uniform vertical illumination should be specified. A bi-asymmetric distribution from a [parabolic louver](#) can also provide high vertical footcandles. In narrow halls, products are typically mounted with the lamps parallel to the walls to provide the best uniformity. In wider halls, products are typically mounted with the lamps perpendicular to the walls in order to provide enough light for the lockers.

## Stairwells

Stairwells require adequate vertical and horizontal illumination to allow students to move safely between floors. The edge of each step should be easily seen to prevent accidents. **Approximately 15 footcandles are recommended for stairwells.**

Since most stairwells are unsupervised, it is good practice for the lighting selected to be vandal-resistant and tamper-proof. [Wall brackets](#) are excellent for illuminating stairwells – they can come standard with a high impact lens and offers optional tamper-proofing. Vandal-resistant wraps and surface-mounted lensed units series are excellent choices as well. Surface-mounted cylinders and recessed squares from the downlighting product line also can be used in stairwells.



## Cafeterias

Cafeterias typically have higher ceilings and are often used as multipurpose rooms. In some cases, a stage may be located at one end. Lighting should have multi-level switching or dimming controls to account for the different activities that may take place. **Typical footcandle levels are 30 for the dining area and 50 for the kitchen.** If the cafeteria is to be used as an auditorium, 10 footcandles are recommended for assembly and 5 footcandles for social activities. Good color rendering also should be a consideration in food service areas, and lamp sources with a minimum CRI of 70 should be specified.



General lighting for the dining area can be surface or recessed [fluorescent lensed](#) products or [suspended direct/indirect](#) (suspended products should be specified with dust covers to prevent debris from entering the luminaire). [Downlights](#) can also be used to create a more comfortable environment. If the ceilings are high, HID recessed downlights and surface-mounted cylinders can be used. If the ceilings are an exposed joist construction, then HID [low bays](#) are suggested. Keep in mind that HID lamps do not start instantly and require a warm-up time during both initial start-up and restrike after a temporary power outage. An option may be specified on HID low bays to provide temporary lighting while the lamps are warming up to full brightness.

Make sure the walls are properly illuminated since art work, posters and announcements are often displayed on walls.

If large windows or skylights are part of the design, special lighting controls that take advantage of the available daylight and adjust the lighting levels accordingly are an excellent way to reduce energy costs.

Vandal Resistant products that feature high-impact lenses and tamperproof doorframes also can be specified in cafeterias for additional protection of the lighting equipment.

When the cafeteria is being used for theatrical productions, special theatrical lighting may be required.

## Kitchens

Kitchen Areas require luminaires that are sealed, gasketed and easy to clean. Moisture, flour and grease are prevalent in the air and must be kept off the surface of a luminaire to maintain the lighting levels. [Wet location troffers](#) with optional lens gasketing (LG) meets the requirements of the FDA and USDA and is an excellent choice for commercial kitchens. This is a wet location troffer that has an inverted lens (smooth surface on the room side) making the product easy to clean and maintain. If a surface-mounted product is desired, then such [wet location products](#) are also available.



## Bathrooms

Bathrooms require extra lighting at the mirrors to eliminate shadows from faces. **30 footcandles are recommended for grooming tasks, while 15 footcandles are suggested around the lavatory.** Lighting equipment should be directed toward the person and not the mirror. [Wall brackets](#) are good choices over the mirrors. Since vandalism may be a problem in unsupervised bathrooms, the best choice should come standard with a high-impact lens and have a tamperproof option. The general lighting can be achieved with [lensed troffers](#) or surface mounted [wraparounds](#). Vandal resistant versions may be the most appropriate choices. To create a more comfortable environment, downlights can be used for the general lighting and [fluorescent linear](#) products can be installed along the perimeter behind the stalls to provide uniform illumination.

Color rendering also should be a consideration when lighting a bathroom. In general, lighting adjacent to mirrors should utilize lamp sources with a low color temperature (3000K) and high color rendering (70 CRI or higher). This will result in good rendition of skin tones.

To conserve energy, [occupancy sensors](#) can be mounted in bathrooms to turn the lights off automatically when not in use. In addition, the absence of a wall switch eliminates the opportunities for student pranks.



## Gymnasiums

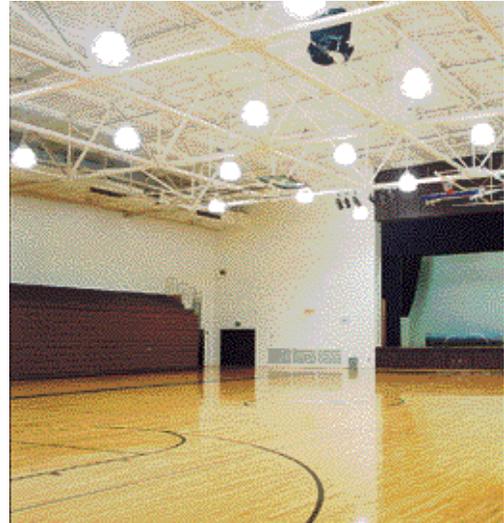
Lighting products used in gyms should be durable enough to withstand the impact of sports equipment, such as a basketball, without shattering or falling to the ground. **Optional wireguards and safety chains are recommended for all products installed in gyms.** [HID luminaires](#) are among the products recommended for gymnasiums. Keep in mind that HID lamps do not start instantly and require a warm-up time during both initial start-up and restrike after a temporary power outage. A [quartz restrike option](#) may be specified on some HID products to provide temporary lighting while the lamps are warming up to full brightness.

Fluorescent lighting, such as an [industrial fixture](#) with a wireguard, are sometimes used in gyms above the bleachers as supplemental lighting.

**The recommended illuminance for general exercising and recreation is 30 footcandles, for college basketball is 100 footcandles and for high school basketball is 75 footcandles.**



Gyms are typically used for many functions other than basketball, such as physical education class, graduation, concerts, dances and community meetings. A good design technique is to provide the highest illumination required and utilize [dual-level switching](#) to lower the light levels and save energy. Some such systems can be controlled with a manual switch, or if there are skylights in the gym, a photocell can adjust the HID level depending on available sunlight.



## Auditoriums

The auditorium is often used for many functions including assembly meetings, social activities, theatrical events, study hall, concerts and lecture halls. It consists of two distinct areas that require very different lighting -- the seating area and the stage area. **The recommended lighting levels are 10 footcandles for assembly, 5 footcandles for social activities and 30 - 50 footcandles for reading during study hall or intermission.**

A good design technique is to provide the highest illumination required and utilize dimming or [bi-level switching](#) to adjust the lighting to lower levels when necessary.

General lighting in the seating area can be accomplished with various luminaires, including surface-mounted cylinders, recessed [downlights](#) and recessed [lensed troffers](#). [Step lights](#) can be installed to provide for safe movement during low lighting level activities. High ceilings may require HID lamp sources to provide the proper illumination. Keep in mind that HID lamps do not start instantly and require a warm-up time during both initial start-up and restrike after a temporary power outage (optional [quartz lamps](#) are available for back-up lighting). It is common practice to include a few fluorescent or incandescent luminaires in the auditorium that can provide auxiliary lighting during power outages and/or HID restrike delays.

Special theatrical lighting required to illuminate the stage area properly is also available.



## Libraries

Libraries contain stacks for books and open areas for reading and studying and may have computers to assist in locating books. **Illuminance recommendations are 30 footcandles for stack lighting, audiovisual areas, cataloging and circulation desks and 50 footcandles for open study areas.**



Stacks in elementary schools are typically no more than five feet high and are easier to light. The general ambient lighting is sufficient for shorter stacks. Taller stacks require specialized lighting from luminaires that provide high vertical footcandles. Continuous-row mounting is suggested to achieve uniformity.



Ambient lighting can be accomplished with [suspended](#), [lensed](#) or [louvered](#) products, depending on the budget and individual preference. [Downlights](#) can be used to provide task or ambient lighting. If windows or skylights are prevalent, [special lighting controls](#) that take advantage of the available daylight and adjust the lighting levels accordingly are an excellent way to reduce energy costs.

Wallwash luminaires may be required for bookshelves mounted against the walls and for other wall-mounted photos or displays. [Fluorescent](#) or downlight wallwash luminaires can be chosen for these

applications.

The high walls of partitions or carrels tend to create light barriers; therefore, task lighting such as with an [undercabinet luminaire](#) can be specified to provide the proper lighting levels required for reading.



Electronic ballasts are recommended in libraries due to their quiet operation, energy efficiency and superior dimming characteristics.

Multi-level switching, lighting control systems and wallbox dimming are desirable in multimedia rooms or specialty meeting rooms to adjust the lighting levels according to the tasks being performed. To conserve energy, [occupancy sensors](#) can be used in these areas to automatically turn the lights off when not in use.

## Maintenance Rooms

The maintenance room / electrical room is industrial in nature and often serves as the workroom and storage area for the maintenance staff.

**Recommended illuminance for gauge-reading, maintenance and wiring areas is about 30 footcandles.**

Products used in these locations include [industrial luminaires](#). Task lighting can be mounted directly over workbenches to provide additional illumination. Vandal-resistant wraps also can be used in this area to provide additional protection of the luminaire.



Because maintenance rooms are not occupied a high percentage of the day, [motion sensors](#) that automatically turn the lights on and off provide significant energy savings.

## Emergency Lighting

Temporary lighting should be provided in all areas of the school during power outages to allow students to move quickly and safely through the path of egress. Fluorescent luminaires can be equipped with [battery packs](#), which provides 90 minutes of emergency illumination. Since battery packs are mounted inside the luminaire, opportunities for vandalism are greatly reduced. Surface-mounted [emergency lighting](#) unit equipment also can be specified.

AC central power systems can also provide temporary lighting during power outages and are suitable for fluorescent and incandescent sources. The FT fast-transfer system is suitable for HID sources.

To provide temporary lighting for HID lamps during power outages, an Emergency Circuit option can be specified on HID products. This a factory-installed, double-contact, bayonet-base quartz socket with socket leads for use with a separate external emergency power system.



## Exit Signs

Exit signs that are visible and energy-efficient must be specified according to local and national codes. The following are typical areas where exit signs are located in schools:

- ✓ Administrative offices
- ✓ Auditoriums
- ✓ Cafeterias
- ✓ Gymnasiums
- ✓ Hallways
- ✓ Libraries
- ✓ Locker Rooms
- ✓ Technology labs



[LED sources](#) have become popular due to their long life, energy efficiency and excellent visibility. Extreme exits provide the most durability for schools environments. Economical exits also can be specified.

[Retrofit kits](#) makes energy and maintenance costs virtually disappear. With these, almost any stencil-face incandescent exit can be upgraded to an energy-efficient LED sign. The LED light tubes simply install into the existing sockets. Each LED light tube consumes only one watt of energy, and the LEDs feature a rated life of 25+ years.

## Exterior Lighting

Exterior lighting around schools include facade, sign, parking lots, flagpoles, landscape and pathway, canopies and exterior entry ways. Exterior lighting has two main goals:

- to create an attractive environment
- to provide safety and security

There is a wide variety of products for outdoor lighting that are both stylish and durable.

- ✓ Facade and sign lighting -- [Floodlights](#)
- ✓ Parking lot lighting -- [Area luminaires](#)
- ✓ Building Mounted / Security Lighting -- [Wallpacks](#)
- ✓ Landscape and pathway lighting -- [Bollards](#), area luminaires, Cylinders, and Wallpacks
- ✓ Canopy lighting -- [Vandal-resistant](#) products, Cylinders, and enclosed surface-mounts
- ✓ Exterior entry ways -- Vandal-resistant product and wallpacks

Care must be taken to minimize light trespass for schools located near residential neighborhoods. Be sure to specify visor options on floodlights to redirect stray light in these cases.

Photocells can be specified on most exterior lighting to turn luminaires on automatically after dark and keep them on until daylight. In addition, lighting [control systems](#) can be used to program the lighting to turn on and off at predetermined times for efficient energy management.

There also exists a full line of poles in a variety of materials and shapes to meet your post-top area lighting needs.

## Sports

Schools sports include various indoor and outdoor activities. Indoor sports are covered in the earlier section on Gymnasiums.

Outdoor sports often include soccer, tennis, football and track, baseball and softball. Special [floodlights](#) designed specifically for sports facilities, are excellent products for school sporting venues. [Cutoff luminaires](#) are often used to light tennis courts.



# Gallery of Suggested Lighting Products

The following images show lighting products referenced throughout this document. For a complete presentation of products appropriate in schools, see: <http://www.lithonia.com/schools/products/default.asp>

Area Luminaires



Downlights



Kilowatch



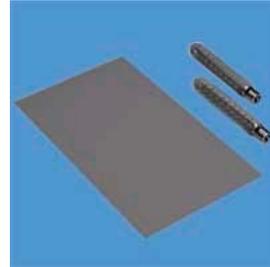
Battery Packs



Emergency Lighting



LED Exit Retrofit Kit



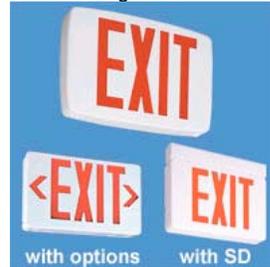
Bollard



Floodlight



LED Exit Signs



Cutoff Luminaire



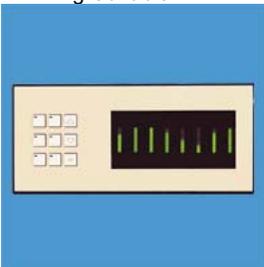
High Bay



Lensed Troffer



Dimming Controls



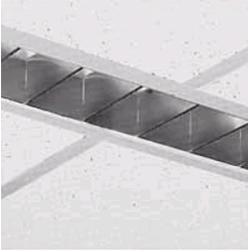
Industrial



Lighting Controls



Linear Fluorescent



Step Lights



Wall Brackets



Low Bay



Sports Lighting



Wallpack



Occupancy Sensor



Surface Mounted Wraparound



Wallwash Luminaire



Parabolic Louver



Suspended Direct/Indirect



Wet Location-Recessed



Quartz Restrike



Undercabinet Lighting



Wet Location-Surface



Recessed Direct/Indirect



Vandal Resistant



# Evaluating Your Lighting System

**Lighting design** is a creative process that generates solutions which provide for the safe, productive and enjoyable use of a space. Proper lighting design addresses not only the quantity of light needed but also the quality of that light. The light we introduce into a space shapes our environment both visually and emotionally. Lighting design must be concerned with a wide range of factors. The following questions should be asked early in the design process to assure that the lighting will meet the needs of the owners and the users and do so efficiently:

- ✓ Who will use this space?
- ✓ How is the space to be used?
- ✓ How critical is the task or tasks to be performed here?
- ✓ Where is the visual task located?
- ✓ What is the proper quantity and quality of light needed for these tasks?
- ✓ Will the space be pleasant for visitors and occupants to enter and spend time in?
- ✓ Will the lighting be compatible with the architecture?
- ✓ Will the lighting work with any available daylight?
- ✓ What color of light/lamp is most appropriate?
- ✓ Will glare or veiling reflections be a problem?
- ✓ Is the proposed lighting within the proposed budget?
- ✓ Is the lighting using energy and other resources responsibly?
- ✓ Is the lighting system flexible (can it be adjusted to meet a changing building configuration)?
- ✓ How will the lighting be controlled?
- ✓ Does the lighting meet all applicable codes?
- ✓ Have all safety and emergency issues been attended to?
- ✓ Is the lighting coordinated with other building systems? ... the furniture?
- ✓ Is the lighting easy to maintain?
- ✓ Are replacement parts available?
- ✓ Will the specified products be delivered on time?
- ✓ Is the lighting designer lighting certified (LC)?

## Links To Additional Information

[Appropriate Light Levels](#)

[Typical Lighting Layouts for Schools](#)

[Lamp and Ballast Issues](#)

[Glossary of Lighting Terminology](#)

# Case Histories

## Security Lighting

### Lighten Up!

By Colette Fleming  
Lithonia Lighting  
Published in School Planning and Management, February, 2001



In the aftermath of recent school tragedies across the country, many administrations have re-evaluated their crisis management plan and conducted a physical audit of their systems to determine appropriate safety precautions for their facility. These considerations often include a telephone and alarm system, access control, crisis response and an evacuation plan. Sometimes overlooked is the need for increased lighting, which is necessary to provide a sense of safety and security any time of the day or night.

Providing a sense of security around the facility is critical to school lighting. After dusk, accidents and the incidence of crime increase. To protect property from theft and vandalism, provide a safer environment for people, and reduce overall liability, administrators are becoming more aware of the benefits of properly design security lighting.

### An Illuminating Plan

“Providing a safe, secure environment is our number one priority right now,” says Kim Wilson, electrical planner for Clark County Schools in Nevada. “When some of these schools were built 30 years ago, we didn’t have these same types of security issues. We are one of the fastest growing counties in the nation and we can’t build the schools fast enough to accommodate the increased population. The older buildings are being retrofit with better lighting systems, and the new buildings are planned with vandal-resistance in mind,” he continues.

Clark County has seen a definite increase in preventive security measures in the past few years. With more than 200 elementary and middle schools and 25 high schools in the county, ranging from rural to urban neighborhoods, Wilson pointed to better lighting as one of the main reasons theft and vandalism has declined in the schools.

Clark County schools, among other schools across the country, have opted for vandal-resistant lighting fixtures to provide the much-needed security required while still providing adequate lighting to the area. These products are built to withstand both physical abuse and environmental extremes. They are typically constructed of heavier gauge steel or diecast aluminum housings, UV-stabilized polycarbonate lenses, gasketing to absorb impact shock and keep contaminants out of the fixture, and tamper-resistant fasteners.

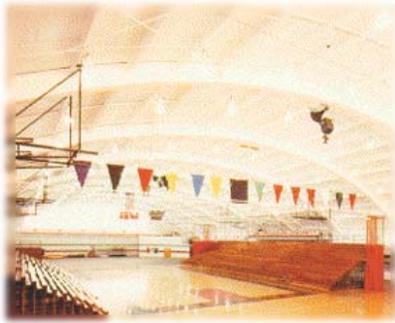
Vandal-resistant lighting fixtures are built for strength and enclosure, and are ideal for unsupervised areas including exterior walkways, classrooms, restrooms, locker rooms, parking lots and stairwells. These fixtures are typically UL Listed for wet locations, enabling them to be used either inside or outside.

Another benefit of security lighting is that it improves visibility on steps, walkways and at exits dramatically reducing the rate of accidents. “We used recessed fixtures with Metal Halide lamps in the locker rooms and halls and under the canopies at the front entrances of the schools. Metal Halide provided enough light to properly illuminate those areas where students gather,” says Wilson.

Security lighting is an investment to the future of our schools, the kids who attend, and the staff who teach there. Effective lighting can prevent the high expense and liability of theft and vandalism. A properly designed, installed and maintained lighting system will pay for itself; the peace of mind of a safe learning environment is money well spent for all involved.

*“Since we’ve improved both the indoor and outdoor lighting in the schools, it seems to have reduced the number of times we have to replace broken fixtures, lamps and lenses. Our school police can also see better to monitor those inconspicuous areas where the kids used to hang out,” Wilson explains.*

## Saving Energy/Improving Lighting



### East Stroudsburg cuts energy, brightens sports facilities with prismatic lighting

East Stroudsburg University of Pennsylvania takes its sports program very seriously. The Division II school is recognized not only for its outstanding basketball team, but for its winning swim team.

Recently, university officials decided to upgrade its gymnasium and natatorium facilities by retrofitting the lighting. Saving energy was the primary motive for replacing the existing system, which consisted of 1,000- and 400-watt mercury vapor fixtures.

“The former lighting system was somewhat of a dinosaur in terms of energy usage,” said Stuart Goodman, electrical designer for Entech Engineering, Reading, Pennsylvania, who designed the project. “We also wanted to improve the quality of the illumination within these facilities.”

The ceiling posed a particular challenge because of its almost cylindrical shape. According to Goodman, the field house is a multipurpose facility, used not only for basketball and volleyball competition, but for more sedate activities such as commencement. The baseball team also practices inside the facility, which made a durable lighting fixture essential.

Administration considered fixtures with acrylic reflectors but decided on Prismalume Luminaires with borosilicate glass because they are tough.

Once in a while, the luminaires do get hit with a hard ball and they have to be able to withstand the punch,” Goodman said.

*“By reducing the lamp wattage, energy usage is decreased by about 50 percent.”*

Fixtures installed above the playing floor in the field house have 400 watt super metal halide lamps to provide more lumen output over the courts. On both sides of the arena, above the bleachers, Prismalume units with 250 watt metal halide lamps are installed. All of the fixture are enclosed and gasketed.

In the field house, the Prismalume fixtures are spaced 14 feet apart in a square pattern. Because the Holophane fixtures replaced the existing units in a one-to-one ratio, they are installed in about the same locations. They are mounted on a two-foot stem, with mounting heights varying from 13 to 43 feet. Footcandle levels are approximately 80 maintained. One of the benefits of the Prismalume Luminaires is the 20 percent uplight, which really “shows off” the ceiling. The ceiling includes structural steel that was painted white prior to the retrofit.

“The payback on the entire project ; including the luminaires, the materials and labor – is about 3.3 years. For the lighting fixtures only, the payback is about a year,” Goodman said.

“The athletic department is really pleased with how bright the space is now,” said Matthew Curran, director of facilities at East Stroudsburg University. “There is a dramatic difference between the former mercury vapor system and the Holophane fixtures. The lighting is much more comfortable.”

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