

Aluminum and fibreglass columns can be damaged by forced oscillation. Columns made of these materials should be avoided in areas where vandalism is prevalent.

### 18.5.4 Lighting controls

Security lighting should always be controlled automatically; activation should never be made the responsibility of an individual. System design should consider the possibility of power outages and lamp failure. Redundancy should be considered when assigning luminaires to 'zones' of control so that the failure of one luminaire does not leave a large area unlit.

HID systems should be designed to be energised prior to darkness by a time suitable for the run-up period of the lamp. Lighting controls should be designed to energise the lighting system when the ambient natural light level is 1.6 times the maintained mean illuminance design value or 15 lx, whichever is higher. This will ensure that designed illuminances will be met during dusk as well as after dark.

Types of automatic controls suitable for security lighting operation include time switches, photo-cells, dimmers and motion detectors.

*Time switches:* these are generally used to control large areas from one location, such as shopping centre car parks. Astronomical time switches can be programmed to adjust on-off times with the changes of season. These types of switches can be quite expensive, and still may not be able to readjust by themselves if darkness is hastened by cloud cover. All time switches should include a battery back-up.

*Photocontrols:* these are used to control individual or small groups of luminaires on circuits that are always energised. They can be designed to automatically energise luminaires during dark periods regardless of time of day. They have the added advantage of not needing to be re-set after power outages or at the changes to and from daylight savings time. Photocontrols should not be mounted where the light sensing area is accessible to flashlight or vehicle headlight beams.

*Dimmers:* these can be used to reduce illumination and power demand by approximately 50 percent during low traffic periods in such applications as office car parks during working hours or shopping centre car parks late at night. By dimming all luminaires, the entire area remains uniformly illuminated. This contrasts with the 'spotty' appearance commonly caused when half of the luminaires are switched off to save electricity. Dimmable fluorescent and HID luminaires require special ballasts. Dimmed HID sources may not have the same colour characteristics as when they are operated at 100 percent light output. This can have implications for camera surveillance as well as the ambiance of the space.

*Motion detectors:* these are used to switch on specific luminaires when motion is detected. Motion detectors can employ infrared or ultrasonic technology. Passive infrared detectors are the predominant choice outdoors, due to the sensitivity of ultrasonic detectors to movement caused by wind. The designer should review the coverage pattern with the manufacturer's data to determine suitability for the application. Due to the run-up time of HID light sources, motion detectors should only be used with incandescent and fluorescent light sources.

### 18.5.5 Maintenance

No security lighting system can remain effective without regularly scheduled maintenance. A planned maintenance program should include: Immediate replacement of failed lamps, repair or replacement of vandalised luminaires, regular cleaning and cutting back of any encroaching vegetation.