Three Elements to lighting your sports field

By Jeff Rogers

Playing under lights turns a game into an event. Lights focus attention on the action, players get more excited, and bleachers swell with fans. As the lights come up, an ordinary field becomes a stage capable of fulfilling dreams.

When planning a sports-lighting project, three design elements must be understood: lighting, structural, and electrical.

Lighting

Sports lighting must meet players' needs, so should provide a specified quantity and quality of light on the field. The required quantity (level) of light is determined by the players' skill level, the speed and size of the ball, the number of spectators, and any television requirements.

Manufacturers should provide calculations stating both initial and maintained light levels. Initial light levels state the light produced when the system is new, while maintained gives the light to be maintained on the field throughout the system's life.

Your project's specifications should also require uniformity, or evenness, of light on the field. Poor uniformity is a safety hazard for players, and unpleasant for spectators. To ensure smoothness, ideal lighting design provides no variation in light greater than one percent per foot.

Manufacturers use computer-generated models called point-by-points. These models are used to evaluate the quantity and quality of proposed lighting levels. It is extremely important that each manufacturer determine how many fixtures are needed to achieve desired light levels, but don't base your decision on a designated number of fixtures. All 1,500-watt metal halide lamps produce the same amount of light. However, superior reflector design allows some manufacturers to use light more efficiently. By controlling spill, or wasted light, and redirecting it onto the field, the second manufacturer has created more efficient fixtures, as well as eliminated environmental or residential concerns that derail many lighting projects.

Structure

The two structural components of a lighting system are luminaire assemblies and poles. Each component affects the initial cost, life-cycle cost, safety, and quality of a project. The luminaire assembly, consisting of a lamp, reflector, ballast mounting, cross-arm, and mounting hardware, should be engineered as a single unit with known structural strengths to ensure the quality of maintained light on the field. The luminaire assembly must be sufficient to support fixtures, weighing up to 60 lbs., or the original aiming pattern of the fixtures may be altered, losing proper quantity and uniformity of light. When aiming patterns are disturbed, the only way to restore light levels is to re-aim fixtures, a costly and time-consuming process.

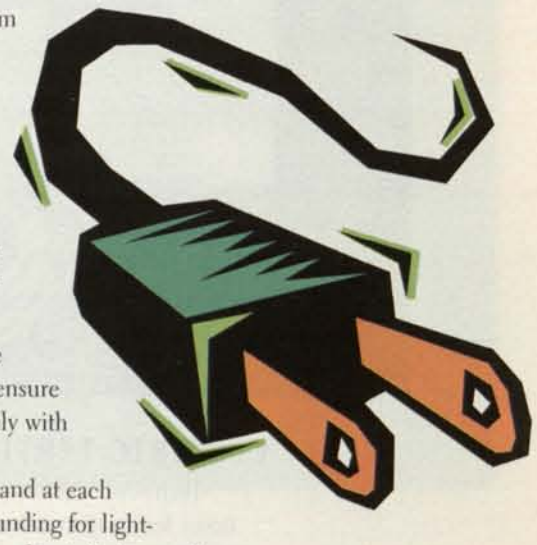
Aiming at the time of installation is also costly, and can be avoided. Technology exists allowing manufacturers to pre-aim fixtures in the factory and eliminate the initial aiming and re-aiming problems that often accompany installation.

Three types of poles are commonly used in sports lighting installations-wood, concrete and steel. Wood poles, usually the least expensive to purchase and install, have high maintenance requirements that devour initial savings. Exposure to rain, wind and even sun causes wood to warp and twist, which can create serious fixture alignment problems.

Concrete poles are often less expensive than conventional steel poles and can be direct buried. However, concrete poles are heavy, expensive to set, with high freight costs.

Steel poles come in two options. Conventional base-plate steel poles require expensive concrete foundations with anchor bolts. An alternative steel pole design avoids costly foundations with a galvanized steel pole shaft that slip-fits over a concrete base set directly into the ground and backfilled with concrete. This allows easy installation, resulting in reduced costs.

Electrical



A sports lighting electrical system should be safe and simple. Although the electrical requirements for athletic fields are specialized, they are far less complex than most commercial and industrial applications. Electrical systems that comply with the National Electric Code, as well as state and local codes, coupled with luminaire assemblies that have Underwriters Laboratory approval, ensure that an installation will operate safely with minimal electrical maintenance.

Grounding at the service center and at each pole is needed to ensure safety. Grounding for lightning protection should be designed and installed according to National Fire Protection Association (NFPA) Code 780. Safety disconnects on each pole provide additional protection. Individual fusing of each fixture avoids gang failure of the lights and eliminates costly emergency repairs.

By keeping several additional factors in mind, the likelihood that a lighting project will please administration as well as players and spectators is enhanced. First, compare the warranties offered by different manufacturers. How long are each, and what items are covered? Multi-year part and labor warranties reveal confidence in the product.

Next, be sure to develop clear-cut specifications concerning how the project should be built, and its expected results. Definite standards prevent unacceptable substitutions, and bids that are overpriced to cover the uncertainties of an under-defined project. ST

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