



City of Mercer Island Parks and Recreation South Mercer Playfields Field Lighting Project

Mercer Island Parks and Recreation has recently completed a sports field lighting project at the South Mercer Playfields artificial turf field. The new system features more energy-efficient lights, were designed to reduce light spill (luminance falling beyond the boundary of the playing field), and continue to operate remotely with online scheduling software.

Background

Field lights were first placed at the All Weather Field (a sand and dirt based playfield mainly used for soccer) in 1985. Eight 90-foot wooden poles supported 84 lamps at the time of installation. Parks staff removed 16 lights in the early 1990's at the advice of the designer to reduce light levels. Over the years, eleven more lamps (15 percent) had burned out, reducing light levels to below industry standards, poles had bent and twisted slightly, and the timer-controlled operating system had become antiquated. An electrical fire had damaged the control box near the field. In 2004, the City of Mercer Island engaged DMD & Associates, a consulting engineering firm specializing in lighting and electrical technology, to analyze and assess the condition of the facility. DMD found the lights to be below standard and identified which elements of the existing system could be re-used and which were to be replaced. New lighting was incorporated into the 2007 Capital Improvement Project to renovate the All Weather Field into artificial turf, and was completed in the spring of 2008.

Current Design

The field lighting system at the new SM Turf field was designed and installed according to industry standards recommended by DMD & Associates.

South Mercer sports field lights are mounted on four 70-foot steel poles which withstand heavy winds, do not warp or bend, and have a considerably greater lifespan than wood. The height was designed to prevent the angle of light rays from blinding field users while covering more field space per pole. Each pole holds 8 1500-watt metal halide lamps. Metal-halide base lights were recommended for use because they last up to three times longer than quartz lamps, reduce glare and are more energy-efficient. Current lighting meets Illuminated Engineering Society of North America (IESNA) standards for safe play for Class III users. IESNA sets the lighting industry standard for safe athletic use and classify four lighting levels based on the type and level of play at any given facility:

- Class I** – Major Stadium with full television coverage (international, national, professional and college play)
- Class II** – Competitive play with 4000 to 6000 spectators (college, professional, sports clubs)
- Class III** – Competitive play with specific provisions for spectators (sports clubs, amateur leagues, high school level play)
- Class IV** – Social and recreational play (practice)

South Mercer lighting meets Class III standards, reflective of the level of play and competition at this field. A new control panel was installed on site; scheduling of lights is handled remotely

through an internet-based scheduling system that can be made accessible to users in order to turn lights off early, resulting in a reduction of “wasted” lights.

A user-activated push button feature was added to the new lighting system which enables track users to utilize the track until the 10pm lighting curfew. The two outside lights of each pole at each corner of the field are illuminated for 30 minutes at the push of a button located at the entrance to the facility. This allows for lighting on an as-needed basis for those wishing to exercise on the track after dark.

Eight poplar trees were removed in the winter of 2008 at the West end of the facility due to root damage to the rubberized running track.

Efforts were made to install lighting that would minimize the spill and glare (obtrusive light that hinders or bothers the eye) to neighboring homes near the South Mercer Playfields. Lamps are fitted with external visors to focus light to specific areas of play on the field. Because of the number of lamps that had burned out from the previous system, lighting levels may have appeared to have increased as a result of a fully functioning system. Light illuminance levels are measured in units of Foot Candles- the amount of light that falls in a given 1 square-foot surface. One (1) foot candle measures about equal to the light on roadways at night. Vertical spill measurements of the old lights at South Mercer past the field of play averaged 3.5 foot candles. The new system measures between .46fc and .89fc of spill at the West and East ends of the property respectively. This means that the amount of spill from the field lighting is less than that of a city streetlight. Testing performed after installation by DMD & Associates found that the new lights meet safety standards for sports played at the field while using 35% less energy to power them.

The graphic below illustrates the factors considered in designing a lighting system like that at the South Mercer Playfields:

