



"Systems with Integrity"

CALIFORNIA TENNIS CLUB

Tennis Court Direct LED Lighting Conversion

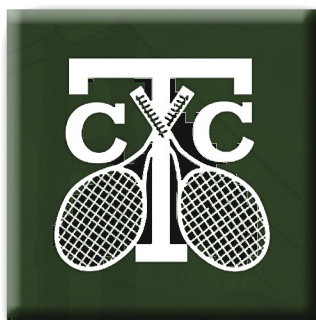
California Tennis Club Club Achieves USTA Class II Lighting
- A Case Study by SES Lighting -

Founded in 1884, The California Tennis Club, located in the heart of San Francisco, the oldest private tennis club west of the Mississippi, has served its members a first class tennis experience for over 130 years. Founded by Therese Austin in September of 1884, the California Tennis Club (affectionately called the Cal Club by its membership) started out with 3 courts and a covered porch. Only since 1976 has the Club had lighting on its current footprint of 10 outdoor courts.

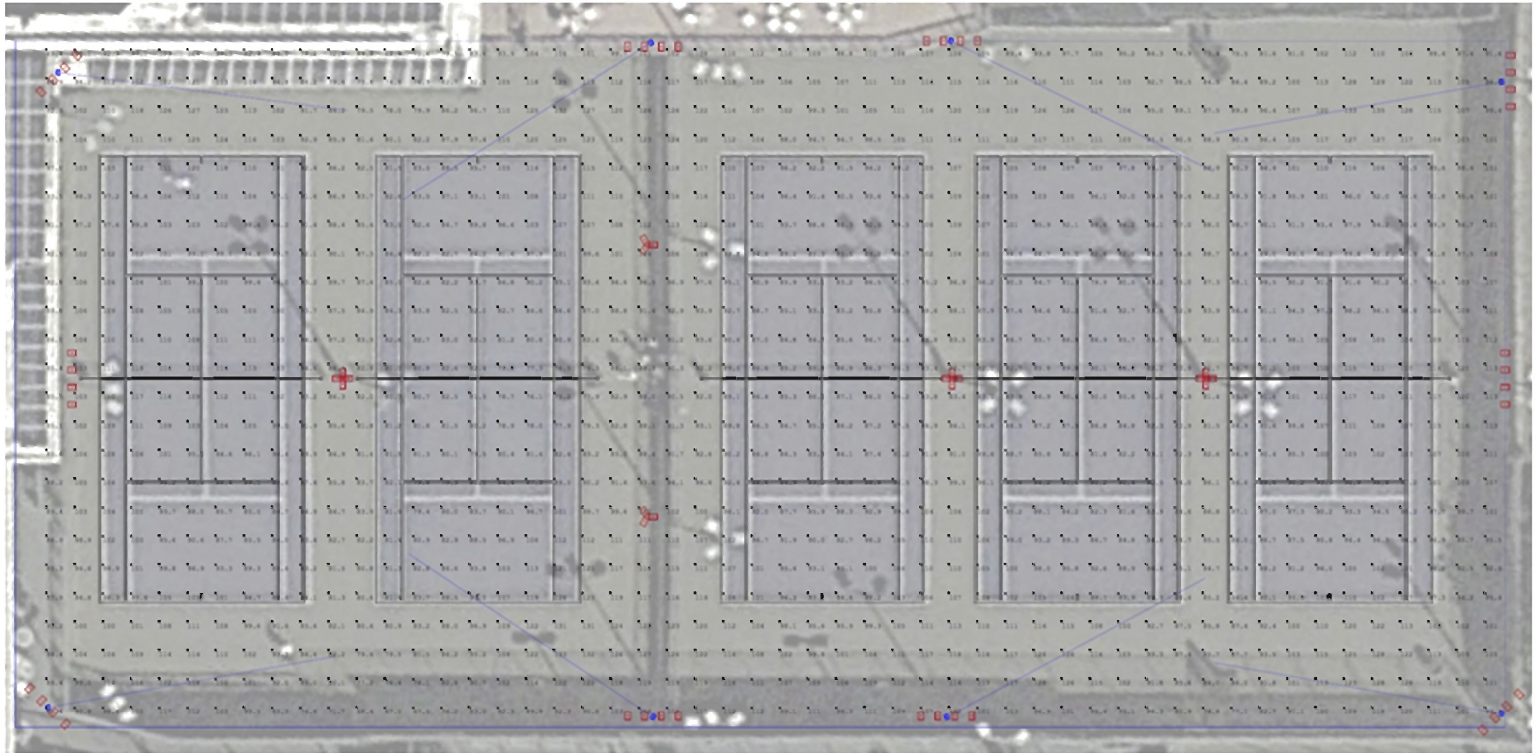
Over the years the Cal Club has continually improved every aspect of the tennis experience including premium Plexicushon, radiant heated courts. When the Club installed the Plexicushon, radiant heated courts, LED technology could not provide the output to appropriately light the court surfaces. In late 2015, Tim Odenweller, General Manager began to research improving the Club's metal halide lighting system to LED technology. Many LED light fixtures were on the market, but none could provide the appropriate lighting and uniformity without adding poles at a significant expense to the Club in having to rework the radiant heating system. Mr. Odenweller had samples installed from various manufacturers but none could provide the right light output for the 35 foot height at the Club. The fixtures on the market were designed for 20 foot poles and simply could not perform to the Club's high standards.



A Helicopter Delivering the First Light Fixture to Center Court in 1976



In March of 2016, Tim Odenweller contacted Nelson Scott, Founding Owner of SES Lighting. Mr. Scott had extensive experience with LED sports lighting technology and had successfully converted tennis facilities in the Bay Area and around the country to LED lighting systems. Mr. Scott traveled to San Francisco and evaluate the pole positions and light levels. He took light meter readings and measurements on all of the courts and began the process of figuring out with LED lens optics, the right solution for Courts 1-5 closest to the Clubhouse. The Club's light levels were what you would expect from metal halide lights with an average of 30 foot-candles. Mr. Odenweller gave Mr. Scott the objective of coming up with a plan with no additional poles and Class II USTA lighting which is an average of 75 foot-candles and a uniformity ratio of less than 2 to 1.



The initial design required modification of the poles to convert from two to three or four LED fixtures to achieve USTA Class II Lighting

Mr. Scott came up with a lighting design that modified the existing light pole configuration to accept additional LED fixture heads. Most important in the design would not only be the optics, but the ability to aim the fixture heads vertically and horizontally to provide coverage in areas of the court surfaces that affected the light uniformity for tennis members at the Cal Club. Mr. Odenweller and Mr. Scott discussed and revised the lighting design over the summer of 2016. Mr. Odenweller evaluated numerous other LED installations in person with committee and board members in the effort to find a facility that would be compatible to the Cal Club's fixture height and spacing. At the end of the day, there were none to provide an appropriate comparison. Mr. Scott was so confident of the design "Let's install the new fixtures on two of the courts so you can evaluate the light quality at your own facility". This was a big risk for SES Lighting as these fixtures were custom-made for the Cal Club's unique situation.

Mr. Odenweller agreed to the test plan on two courts and in October of 2016, Mr. Scott arrived at the Club to work with Erwin Dimacali, the Club's Facility Engineer on the install. Mr. Scott had to execute the design with optics on the fixture heads ranging from 15-75 degrees as well as adjusting the heads to the right angle.



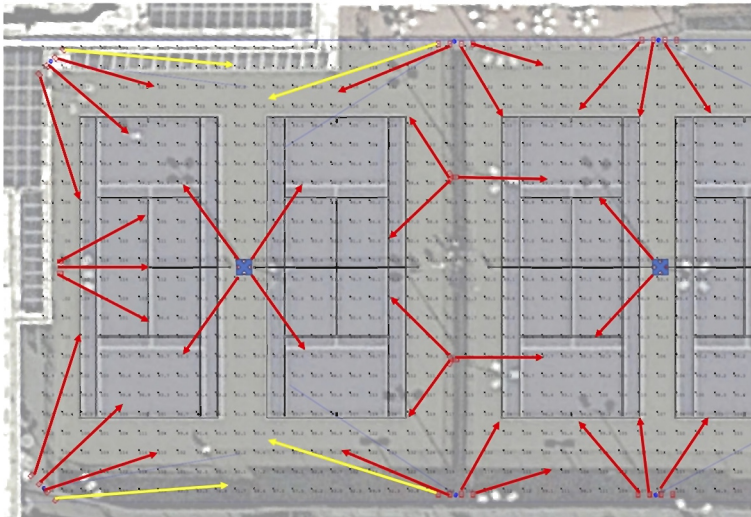
Nelson Scott, COO & Founding Owner took a hands on approach in making sure the fixtures were angled correctly to achieve the precise and correct light distribution for the California Tennis Club

Mr. Dimacali, remarkably had a background as a master electrician and had an in house crew assembled for the installation. The process of installation was a complicated one as heavy lifts could not be used on the Plexicushon court system. Mr. Dimacali built mobile scaffolding for the project which would include modifying the pole tops to accept additional LED fixture heads with slip-fitter brackets.



Erwin Dimacali modified the Cal Club's fixture heads to accept additional LED fixture heads a key component in achieving a successful outcome in this sports lighting project

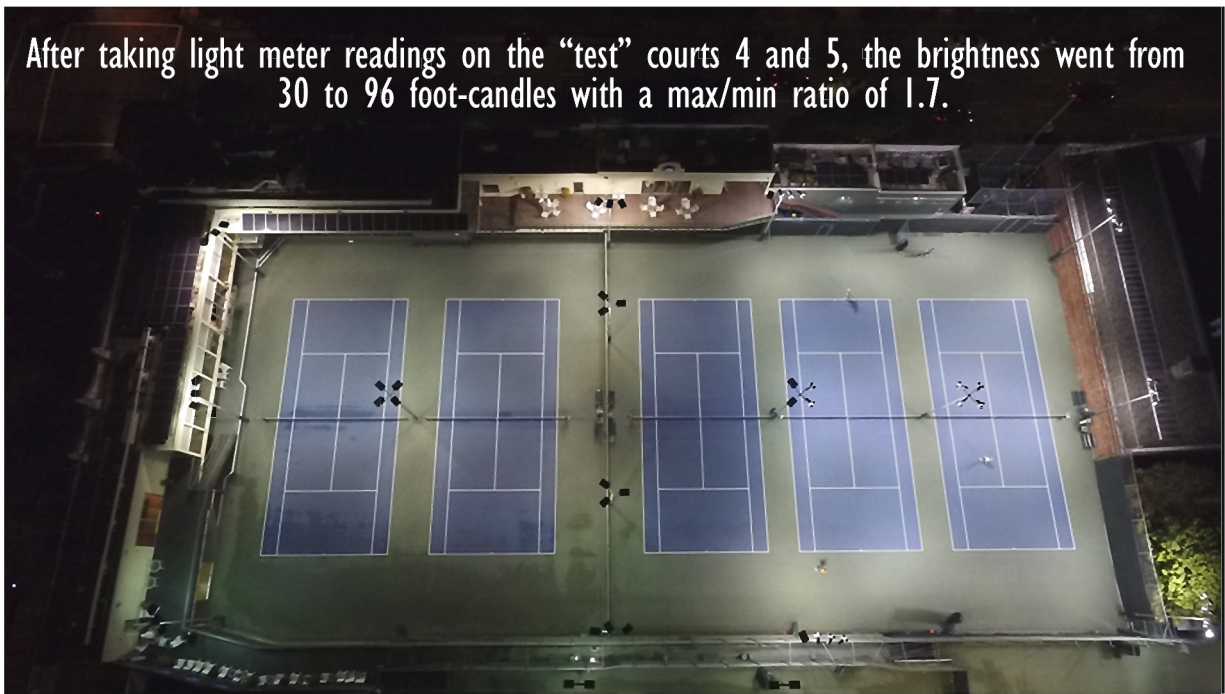
The installation took just over two days to complete. The final step of the installation included aiming the fixtures at night from pre-determined aiming points from the original design. Mr. Scott and Mr. Dimacali adjusted each fixture at night in accordance to the aiming points of the original design.



Precision was a key factor in executing the original lighting design. With the different optical lenses on each fixture if the fixtures are even off a degree, light uniformity would be severely impacted

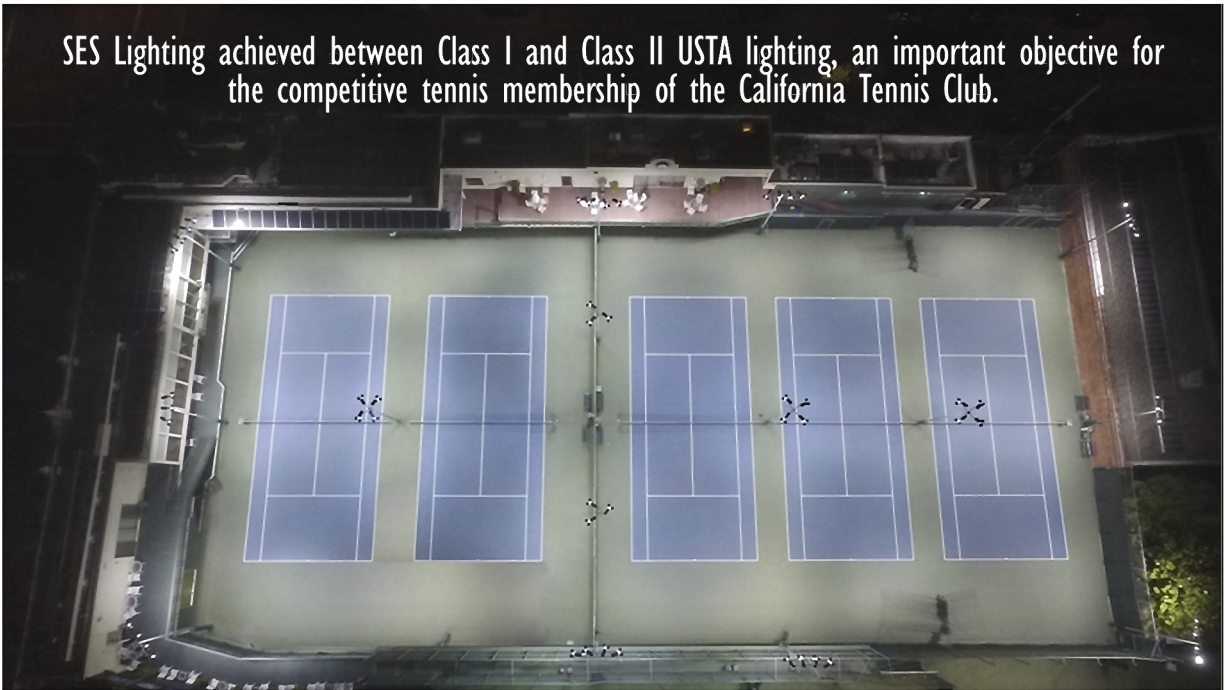


After taking light meter readings on the “test” courts 4 and 5, the brightness went from 30 to 96 foot-candles with a max/min ratio of 1.7.



In the Spring of 2017, the rest of the first five courts were installed with the center court having Class I USTA lighting. The feedback from the membership to Tim Odenweller was overwhelmingly positive on the outcome of the project. The oldest tennis club west of the Mississippi undoubtedly had the finest tennis experience for its membership and guests.

SES Lighting achieved between Class I and Class II USTA lighting, an important objective for the competitive tennis membership of the California Tennis Club.



"Systems with Integrity"

TennisLED.com

17301 West Colfax Avenue, Suite 412

Golden, CO 80401

Nelson Scott (720)280-0672

nscott@seslighting.com