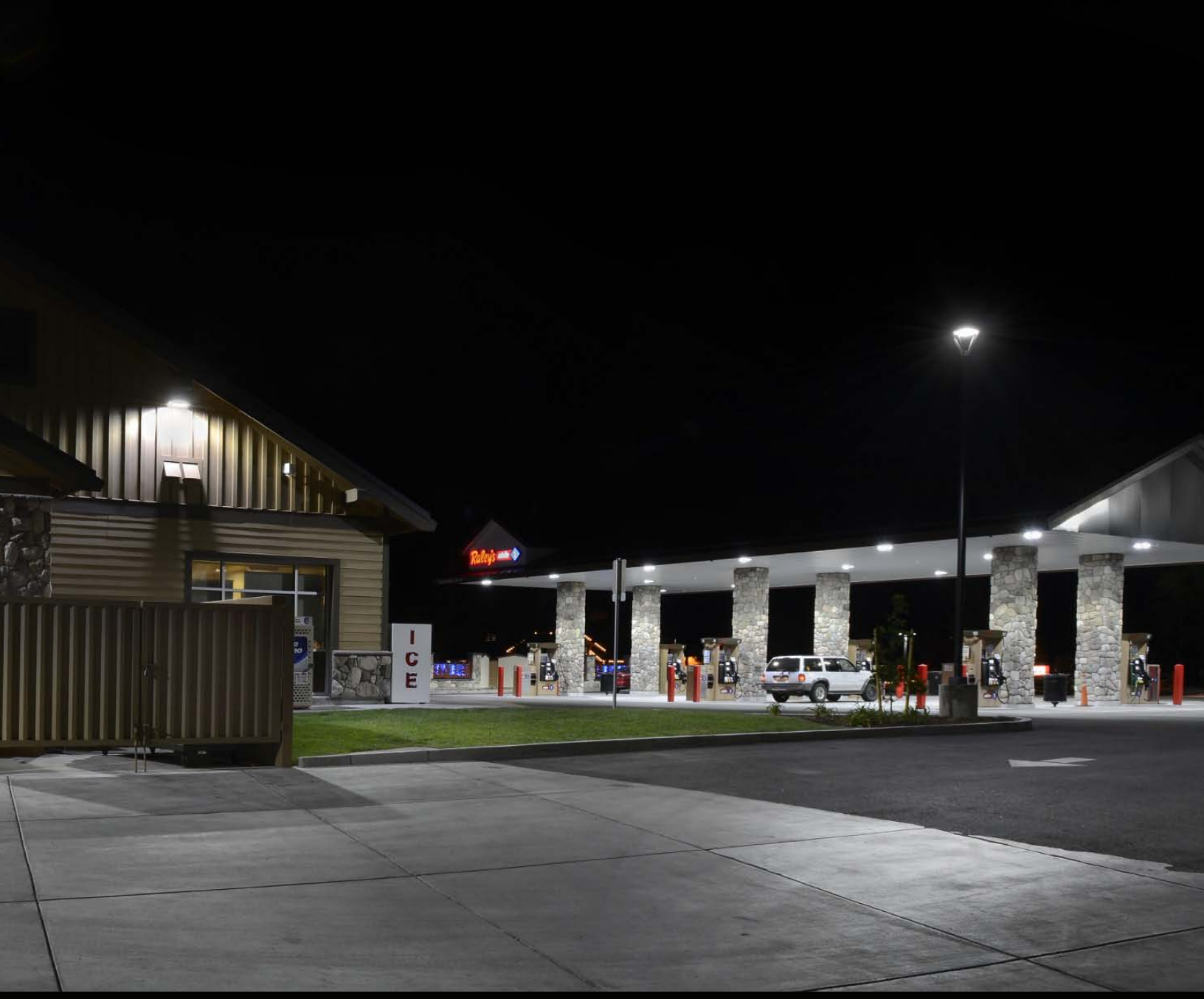


Petroleum & C-Store – New Construction

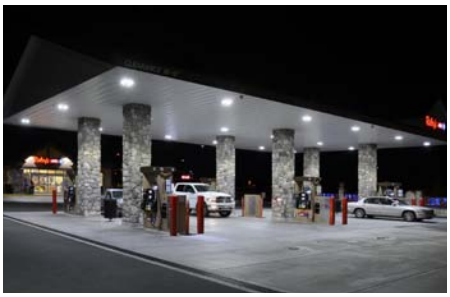
Raley's® Petroleum Station & Convenience Store

South Lake Tahoe, CA

Cree® luminaires controlled with an integrated wireless dimming system provide an energy efficient lighting solution allowing Raley's® to achieve less than a one year payback on the installation.

- Impressive payback of only .95 year
- Fewer luminaires needed compared to traditional technology
- Controlled lighting saves energy & achieves state requirements

CREE®



> "Raley's Supermarkets are fast becoming a model of energy efficiency in their industry. Prompted by an interest in energy efficiency and a recent goal to reduce companywide energy usage by another 10%, Raley's has incorporated numerous, and often groundbreaking, energy saving techniques into their business plan."
>
> **Randy Walthers,** *Engery/ Utility Manager, Raley's®*

REMARKABLE LIGHTING DELIVERS AMAZING PAYBACK

OPPORTUNITY

Raley's® Family of Fine Stores – considered one of the most environmentally-advanced grocery chains in the nation – is dedicated to improving sustainable operations in its 128 stores. A goal for the California-based provider of fresh markets, convenience stores and petroleum stations is reducing overall energy consumption in new store construction and upgrades to existing locations. When Raley's® energy and utility manager Randy Walthers sought an efficient lighting system for a new location in South Lake Tahoe he looked for an improvement over the fluorescent, metal halide and halogen spot lighting systems that were causing maintenance issues at existing store and petroleum station locations. His search led him to Hi-Def Lighting & Electric Inc. who specified interior and exterior LED lighting equipped with a sophisticated control system that achieves California's daylight control requirement.

SOLUTION

With a robust product line for complete interior and exterior LED lighting, Cree offered alternatives for the site's diverse requirements. The new petroleum station, car wash and convenience store feature lighting systems from Cree that maximize the benefits of its advanced LED technology and controls-friendly compatibility. The store's interior has 24 luminaires including the Cree 304 Series™ recessed soffit luminaires with dimming options in the general customer sales areas and restrooms. Cree CR24™ T-bar luminaires are installed in the work room and tech room ceilings. Thirty-six Cree LED luminaires illuminate exterior spaces including Cree Edge™ wall-mount security luminaires and Cree Edge™ round post-top mount and direct-arm mount area luminaires in the parking lot. Cree 304 Series™ recessed canopy luminaires are installed under the fuel canopy deck and the carwash bay includes Cree 227 Series™ recessed soffit luminaires with dimming option.

BENEFITS

Because the Cree® LED luminaires provide better light levels over traditional fixtures, fewer needed to be installed at the South Lake Tahoe store and station than similar Raley's® locations that use fluorescent, metal halide and halogen spot fixtures. The LED luminaires could also be spaced further apart by comparison to the traditional technology fixtures. Raley's® and Hi-Def Lighting & Electric Inc. examined differences in the lighting by comparing overall fixture cost including installation time, controllability of lighting, circuit design, switching and energy usage per room or fixture zone. The result of the comparison revealed very minimal additional cost for purchase and installation of a complete Cree LED luminaire system.

The largest benefit of the Cree lighting installation is the energy savings that has exceeded expectations and contributed toward an impressive payback of only .95 year. The payback was achieved by comparing the energy use and maintenance for compact fluorescent, electronic ballast F32T-8 fluorescent, metal halide and halogen spot fixtures used at Raley's® existing location in Fair Oaks, Calif. to the new Cree LED installation, and factors in the cost of the luminaires.

Most Cree LED luminaires are a controls-ready lighting solution designed for compatibility with a variety of system protocols utilizing wireless and power-line carrier technologies. Cree luminaires offer an optional integrated occupancy sensor which can further reduce energy use through motion detection. This ability to dim many of the Cree luminaires is useful in conserving energy and achieving California's requirement of controlling fifty percent of daylight use through off or dimming. In this case, instead of turning the luminaires off, daylight control sensors detect ambient light and dim them when they are not necessary. A lighting control system was selected that incorporates the Cree luminaire on-board occupancy sensors, timed schedules, ambient light sensors and wall switches for over-ride control. The external lighting control system is self-adjusting depending upon the amount of ambient light detected. For example, Cree 227 Series™ recessed soffit luminaires in the car wash bay operate at twenty-percent power until the occupancy sensor brings them to full power and dims them back down to twenty-percent when not in use.

An unexpected benefit of the Cree lighting installation proven to be very positive for Raley's® operations are the universal drivers that provide continuous illumination during unexpected brownouts that are common to the area. In South Lake Tahoe the voltage will drop as much as 30 percent numerous times during hot afternoons creating multiple problems with electrical systems throughout the site. Fortunately, the Cree luminaires are unaffected by erratic voltage drops and continue performing at peak efficiency due to dependable drivers that include AC input protection that senses and accommodates for short-circuit and over-voltage.

"Raley's Supermarkets has taken steps in their path to reduce energy consumption, paving the way for other grocers to do the same."

Randy Walthers, *Engery/Utility Manager, Raley's*

IN THIS CASE STUDY

304 Series™
RECESSED CANOPY / SOFFIT LUMINAIRE

- Minimum 70 CRI
- CCT: 4000K (+/-300K), 5700K (+/-500K)
- UL wet listed
- Driver centrally located
- Convenient electrical inspection access from below
- Low-profile design

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227 Series™
RECESSED SOFFIT LUMINAIRE

- Minimum 70 CRI
- CCT: 4000K (+/-300K), 5700K (+/-500K)
- UL wet listed
- Multi-Level options
- Upgrade kit options
- Modular, low-profile design

Cree Edge™ Series
AREA / AREA ROUND LUMINAIRE

- Minimum 70 CRI
- CCT: 4000K (+/-300K), 5700K (+/-500K)
- Utilizes BetaLED® Technology
- UL wet listed
- Two-Level options
- Modular, low-profile design

Cree Edge™ Series
SECURITY LUMINAIRE

- Minimum 70 CRI
- CCT: 4000K (+/-300K), 5700K (+/-500K)
- Utilizes BetaLED® Technology
- UL wet listed
- Multi-Level options
- Modular, low-profile design

CR Series
TROFFERS

- 2000 - 5000 lumens
- 22 - 50 watts
- 90 - 110 LPW
- 90 CRI
- 3500K or 400K CCT
- Up to 50,000-hour lifetime
- 0 - 10V dimming to 5%; step dimming to 50%

BetaLED™ TECHNOLOGY

Cree BetaLED® Technology uses a total systems approach combining the most advanced LED sources, driver technologies, optics and form into each product. The patented NanoOptic® technology, available in more than 20 distributions, provides a level of optical control and thermal management that traditional light source technology cannot provide. Combined with the DeltaGuard® Finish, the finest industrial-grade finish available, the result is outstanding target illumination, lasting performance and optimum energy efficiency.

PARTICIPANTS

End User: Raley's

Electrical Distributor: Hi-Def Lighting & Electric Inc., Rocklin, CA

Cree Petroleum Agency: Trengove Marketing & Sales, El Dorado Hills, CA

CREE®

Join the LED Lighting Revolution.

Learn more at: **www.cree.com/lighting** | **info@cree.com** | **800.236.6800**

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