

Circadian Lighting Projects

Lessons Learned

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Powering forward. Together.



Circadian lighting projects

Recent projects:

- ACC Care Center Phase 1 (2015)
- ACC Care Center Phase 2 (2017)
- Eskaton Monroe Lodge Phase 1 (2016-2017)
- Eskaton Monroe Lodge Phase 2 (2017-2018)
- Folsom Cordova Unified School District (2017 to present)

ACC Care Center: background

- Prominent nursing home in Sacramento
- 5-star rated facility
- Average age of resident is 87
- Wheelchair bound
- 2/3 of the current residents have been diagnosed with some form of dementia
- Planning major upgrade (100 beds)



ACC Care Center (phase 1): new lighting

- Tunable-white light fixtures in resident rooms & hallways
- LED rope lights with sensors under the beds
- Handrails with LEDs in the bathrooms



ACC Care Center (phase 1): results

- Reduction in falls
- Energy savings = 65% (hallways)
- Residents sleeping through the night
 - Sleeping in their beds
 - Reduction in psychotropic and sleep medications
 - 40% reduction in behaviors (yelling, agitation, crying)



Been waiting 3 hours
for a high five!

*Complete report is available at: <https://www.smud.org/assets/documents/pdf/ACC-Care-Center-Lighting-Project.pdf>

Eskaton Monroe Lodge: background

- Eskaton Monroe Lodge, Sacramento, CA
- Independent Living Facility
- 97 apartments, 6 floors
- Average age: 84 years old
- Our study: 13 apartments, 15 individuals



Eskaton Monroe Lodge: new lighting

- ✓ Tunable-white light bulbs used in light fixtures, table and floor lamps in apartments
 - White light during the morning
 - Daylight color during the early afternoon
 - White light during the afternoon
 - Warm light during the evening
- ✓ Nighttime safety lighting



Eskaton Monroe Lodge (phase 1): results

- Estimated energy savings = 20%
- Eskaton survey results
 - ✓ 22% reduction in time needed to fall asleep
 - ✓ 27% reduction in daytime drowsiness
 - ✓ 45% perceived improvement in energy levels
 - ✓ 72% improvement in daytime activity levels

*Complete report is available at:

<https://www.smud.org/assets/documents/pdf/Eskaton-Circadian-Lighting-Project.pdf>



“The new lighting has restored confidence and reduced the fear of falling!”

FCUSD project: background & scope

Folsom Cordova Unified School District (FCUSD)

- Three classrooms:
 - One general education classroom
 - Two classrooms for students with Autism Spectrum Disorder (ASD)
- Worked with families of two students with ASD in their homes
- Report scheduled for completion by December 2018



Photo: courtesy of PNNL

Lessons learned

- Product availability can be a challenge!
- Working with seniors can be very time consuming.



Tell me when it's over!

Lessons learned (Eskaton Monroe Lodge)

How long do you think it would take to interview one person, install some lamps and light bulbs, program the controls and take a few measurements in a 500-800 ft² apartment?

- a. 30 minutes per visit.
- b. 45 minutes per visit.
- c. 60 minutes per visit.
- d. More than 60 minutes per visit.

13.5 labor hours per apartment!

(3 people x 1.5 hours per visit x 3 visits)



Lessons learned

- Product availability can be a challenge!
- Working with seniors can be very time consuming.
- Can be expensive.



I'm gonna get fired!

Lessons learned (Eskaton Monroe Lodge)

The original lighting was so poor, the team had to purchase and install the following:

- 23 floor lamps
- 12 table lamps
- 22 floor can lights
- 16 bathroom vanity lights
- 13 dining room lights
- **347 LED bulbs!**

*For just **13** apartments!*



Lessons learned

- Product availability can be a challenge!
- Working with seniors can be very time consuming.
- Can be expensive.
- External environmental factors can totally ruin your project results!



They did what?!



Despite the challenges do it anyway!



Thank you!!

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