Bookstack Lighting at McHenry Library

2016 Best Practices Award

Lighting Retrofit Category
Project Description

- Specifically address bookstack lighting
- Pre-existing controls = ON/OFF (no dimming)
- Projects completed in other areas of the building left stacks mostly untouched
- Scope: LED Fixture conversion; add occupancy & dimming capability
Library Bookstacks – a unique space

- Lots of light required when occupied
- Largely UN-occupied during open hours (datalogging showed ~6%-9% occupancy)
- Lights were scheduled ON for many hours before & after library’s open hours, for custodial & staff (~3 hrs/day or 1000 hrs/year)
- On/off occupancy control not an option - a large section of unlit book stacks is not a viable solution to the library staff – it looks creepy
Best Practices Demonstrated

• Schedule optimization
• Demand-based Illumination
• Deep Green: Fixtures & Controls
• Strategic sensor placement for cost savings
• Collaboration
Design & Planning

- Used software simulation to aid in fixture choice
  - Lumen levels considered at work plane as well as on the faces of bookstacks

- Created a lighting fixture & control capability “wish list”
  - non-OFF, but dimmed, vacant setting
  - ability to schedule changes in control settings in advance
  - sweep on* function
  - high CRI
  - visibility of books on all shelves

*Dialux lighting model simulation from occupant POV*
Optimized Lighting Schedule: Demand-based Illumination

- Sweep on to low/unoccupied level only during open hours
- During closed hours, low level = OFF
- Different profiles & light levels for different areas’ needs/use patterns
Deep Green: Fixtures & Controls

- Financial implications
- Design concerns - responsibility
- Constructability and scheduling impact consideration
- Occupant happiness (before, during & after project)
- ...

Longer payback project now would lead to lowest overall cost of ownership for the lifetime of the project.

“And this is where our ROI became an IOU.”
Collaboration with Occupants

- Early-on establishment of communication flow process
- Key occupant: facility coordinator
- Point of contact in general, but emphasis on reaching out to wider occupant/stakeholder group regularly
Project Results

Total project cost: $698,449.90
Estimated annual energy savings: 407,548 kWh
Estimated GHG Emissions reduction: 79.06 MTCO2e / year
Lessons Learned

• Getting the ball rolling is important
• Collaboration with occupants – before and AFTER is important
• Clarity with contractor
Before & After
Before & After
Before & After