CLANTON & ASSOCIATES

LIGHTING DESIGN AND ENGINEERING

Lighting Case Studies Cost Analysis

City of Fort Collins, Colorado
October 2, 2020

Summary

Clanton & Associates, Inc has reviewed the exterior lighting for five projects in the City of Fort Collins, all of which have been completed in the last seven years. Detailed information about each of the five sites can be found in the report titled “Lighting Ordinance Case Studies.” In order to provide additional understanding on how revisions to the Fort Collins outdoor lighting ordinance may impact future project costs, Clanton & Associates further considered the cost of three of the five projects.

This cost analysis is high level with the following assumptions and additional considerations:

- This is not a life cycle cost analysis.
- It is assumed that all site lighting not attached to buildings are currently controlled via photocells. Photocells measure the amount of light provided by the sun and turns lights on and off accordingly.
- The cost of the current exterior lighting plans is assumed based on typical luminaire costs for luminaires of each style, lamp technology, and pole height. Costs vary significantly, and exact cost of the installed luminaire on date of purchase could not be determined.
- There are many ways that the lighting plans could be redesigned to meet the proposed outdoor lighting ordinance. Clanton & Associates has considered one possible redesign for each of the three sites, based on common practice and current recommendations by the Illuminating Engineering Society (IES).
- Cost estimates exclude electrical infrastructure, installation, and design fees.

Eye Center of Northern Colorado

Estimated Installed Cost: **$118,800**
Estimated Proposed Cost: **$103,700**

Reducing the number of luminaires to meet the proposed lumen limit, even with the addition of more sophisticated lighting controls, reduces the overall cost of the system.

Assumed Changes

The installed exterior lighting at the Eye Center of Northern Colorado exceeds site lumen limits set forth in the proposed lighting ordinance. To bring the exterior lighting into compliance, the following changes are suggested:

- Reduce total lumens at parking lot
    - Reduce parking lot light lumen output from 5800 lumens to 4700 lumens and reduce the quantity of parking lot lights from 27 to 23
        - *Calculations show that the parking lot meets IES recommended parking lot light levels with these changes*
- Reduce lumen output of wall packs
    - Two wall packs are specified at 4000 lumens each. Sufficient egress illumination can be provided by wall packs that are 2000 lumens or less.
- Reduce quantity of façade luminaires
    - The design originally has 22 wall sconces. Reducing the quantity by half removes excessive site lumens.

- Implement lighting control system to further dim luminaires when parking lot is not in use. Luminaires may also be shut off by time clock
    - It is assumed that building-mounted luminaires are already connected to the building control system.
    - Parking lot luminaires may be controlled by a dimming relay panel located in the building, or by individual nodes attached to each luminaire.

The Grove

Estimated Installed Cost: **$128,500**
Estimated Proposed Cost: **$140,700**

Selecting a luminaire with improved optics may increase the cost per luminaire. The availability of affordable, low glare parking lot luminaires is increasing in the market.

Assumed Changes

The installed exterior lighting at the Grove is under the proposed site lumen limit established by the proposed lighting ordinance. However, the lighting does not meet BUG ratings and is particularly glary.

- Select an alternative luminaire with different light distribution and lower BUG rating.
    - For this exercise, it is assumed that a new luminaire with improved optical performance could cost $200 more per luminaire. This is likely a high estimate.
- Since this is a multifamily residential site, it is not recommended to provide curfew dimming controls.

Additionally, bright wall packs are installed on the outside of the buildings. These were not shown in the reviewed documentation. In an improved designed, these luminaires would be reduced in both quantity and lumen output.

The Slab

Estimated Installed Cost: **$87,500**
Estimated Proposed Cost: **$66,300**

Reducing the height of the pole will reduce the cost of the design. Selecting a luminaire with improved optics may increase the cost per luminaire but will not offset the savings by using a shorter pole. Selecting a lower lumen output luminaire will reduce cost slightly as well.

Assumed Changes

The installed exterior lighting at the Slab exceeds site lumen limits set forth in the proposed lighting ordinance. The luminaires also do not meet the proposed BUG ratings. To bring the exterior lighting into compliance, the following changes are suggested:

- Select an alternative luminaire with different light distribution and lower BUG rating.
    - For pedestrian path, select a luminaire with lower lumen output. This will slightly reduce the cost of the luminaire.
- Decrease pole height from 30-ft to 20-ft.
    - *Calculations show that this does not require the addition of more poles.*
- Since this is a multifamily residential site, it is not recommended to provide curfew dimming controls.