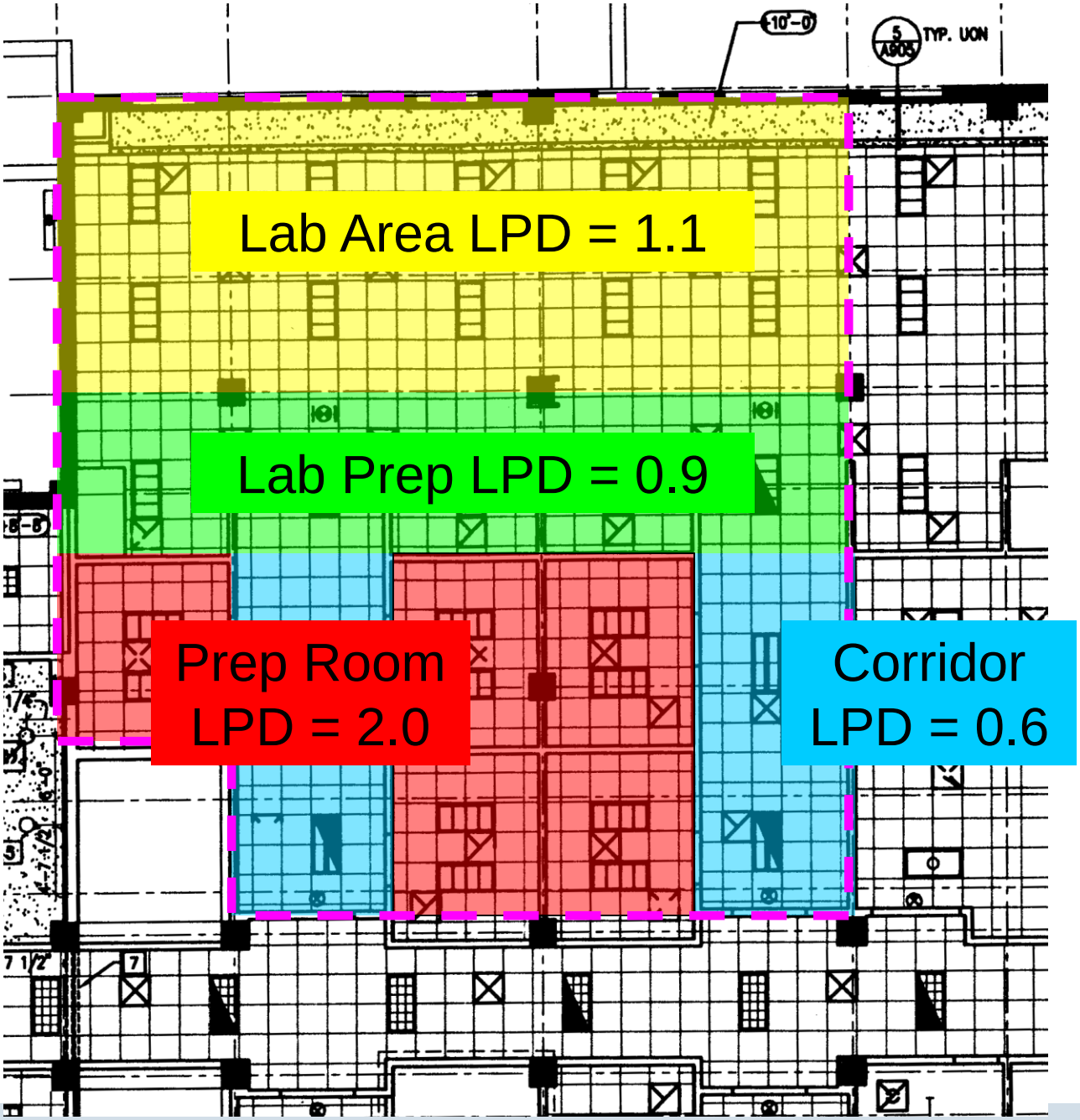
Laboratory Lighting Controls Upgrade

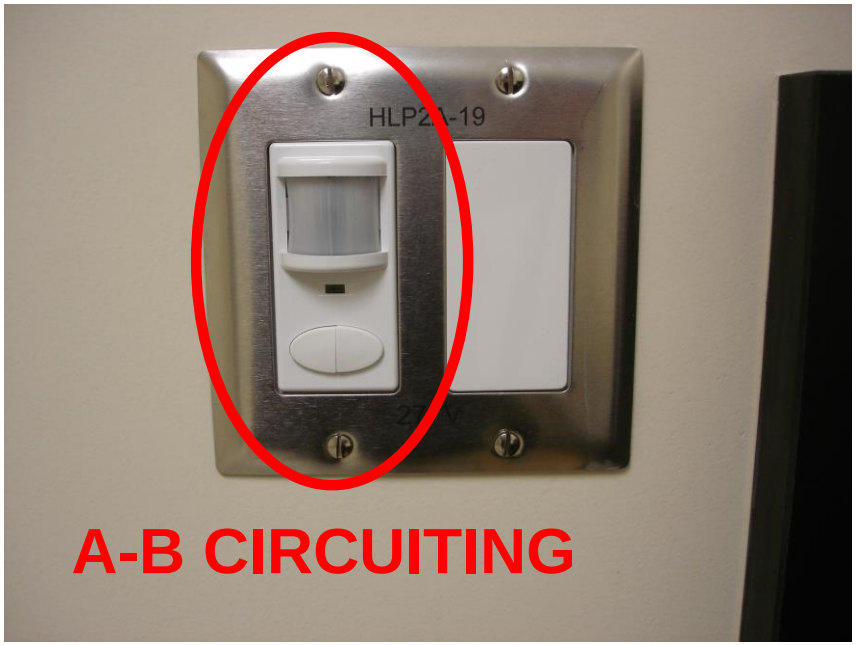
- New Laboratory Building Biological Sciences 3
- Beat Title 24 Energy Standard by 20%+
- Challenge to reduce annual energy consumption from lighting by ~50%
- Extremely low Lighting Power Density (LPD)

  LPD = Lighting Watts / Square Foot
- Lab Environment with ~50 Foot-candle Requirement
- Reducing true LPD not a probable option

BEFORE

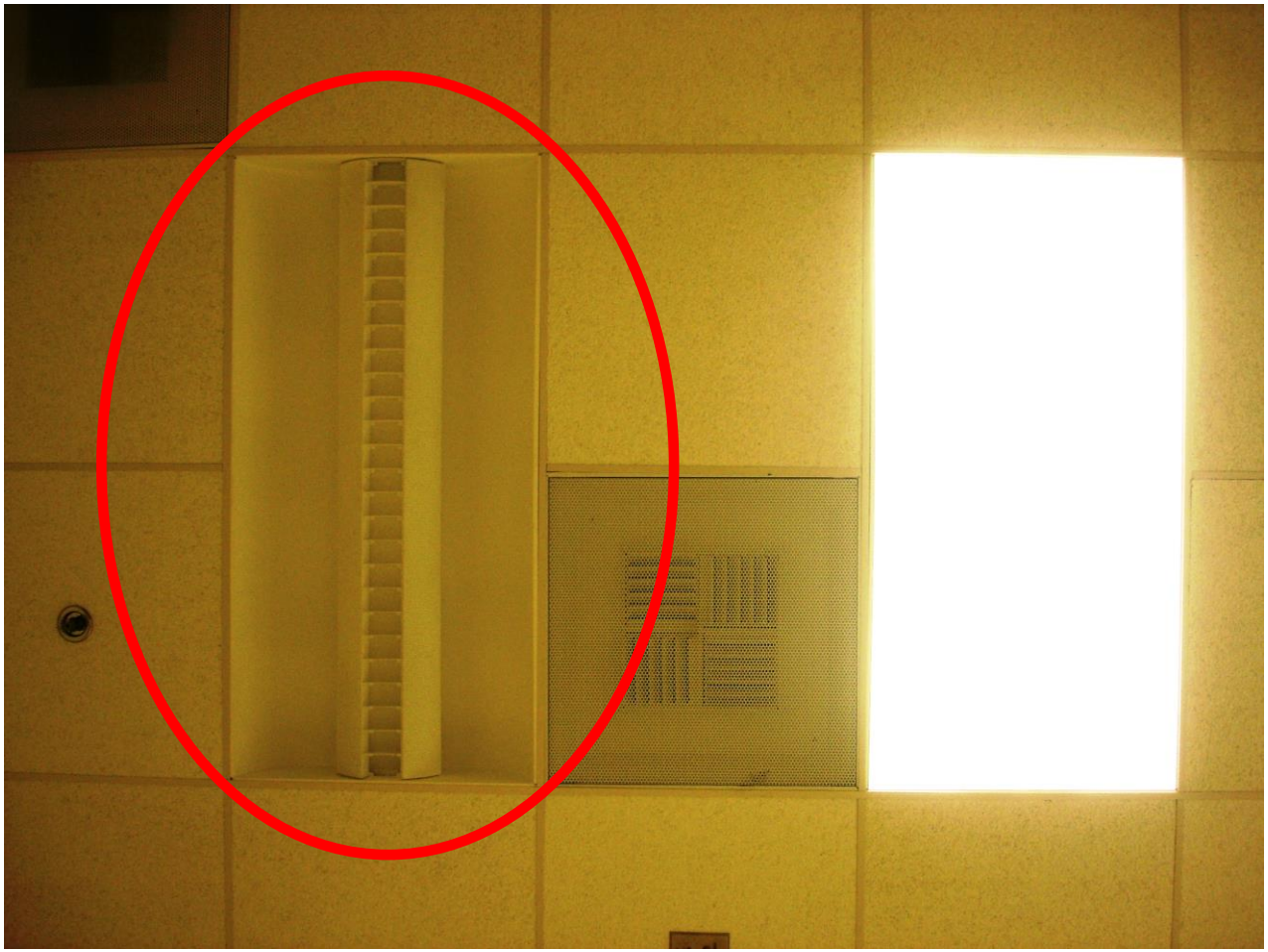

Lab Area LPD = 1.1
Lab Prep LPD = 0.9
Prep Room
LPD = 2.0
Corridor
LPD = 0.6

Manual Switch to Occupancy Sensor

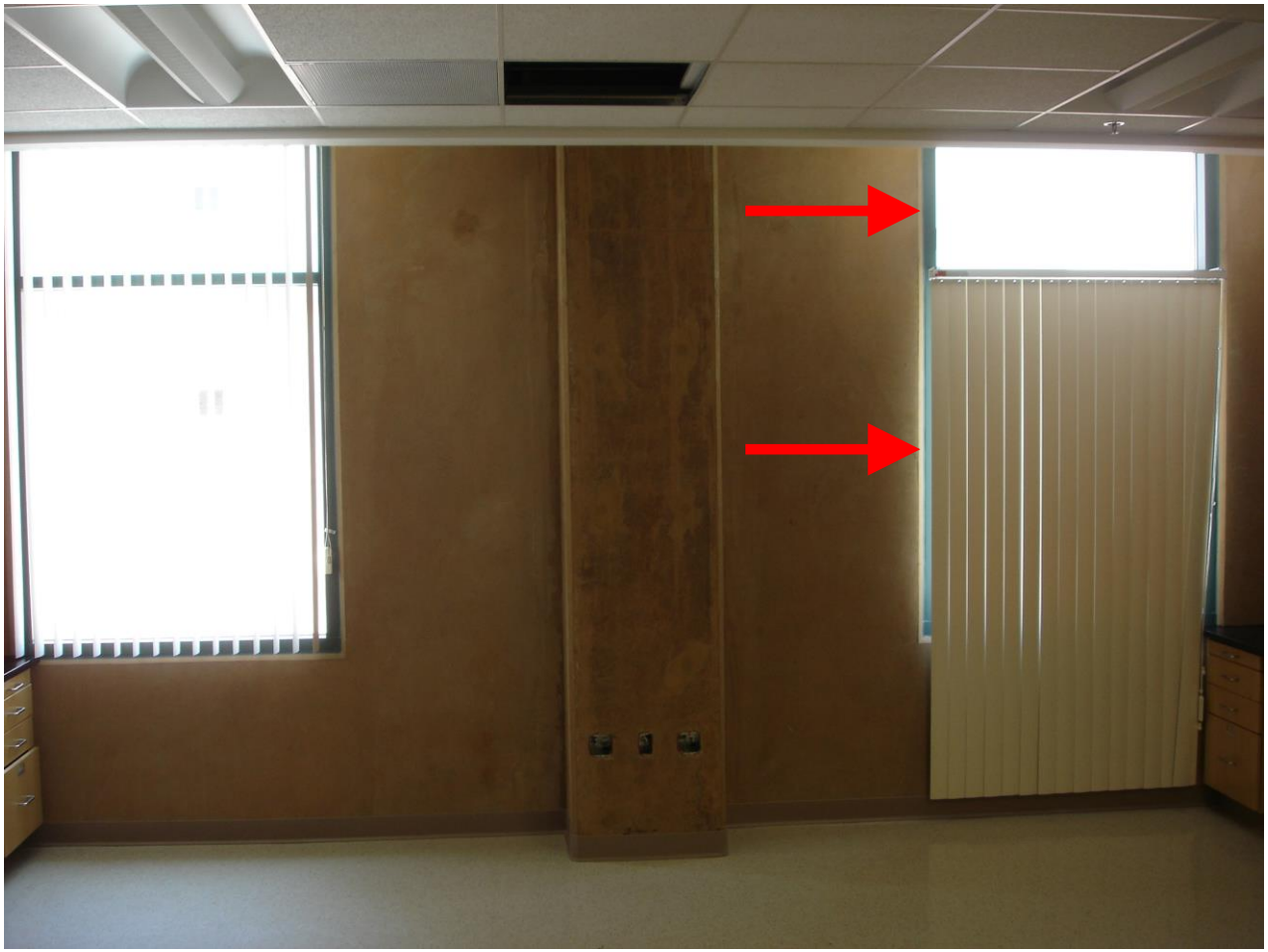


50% Auto On - Manual to 100% - Auto Off

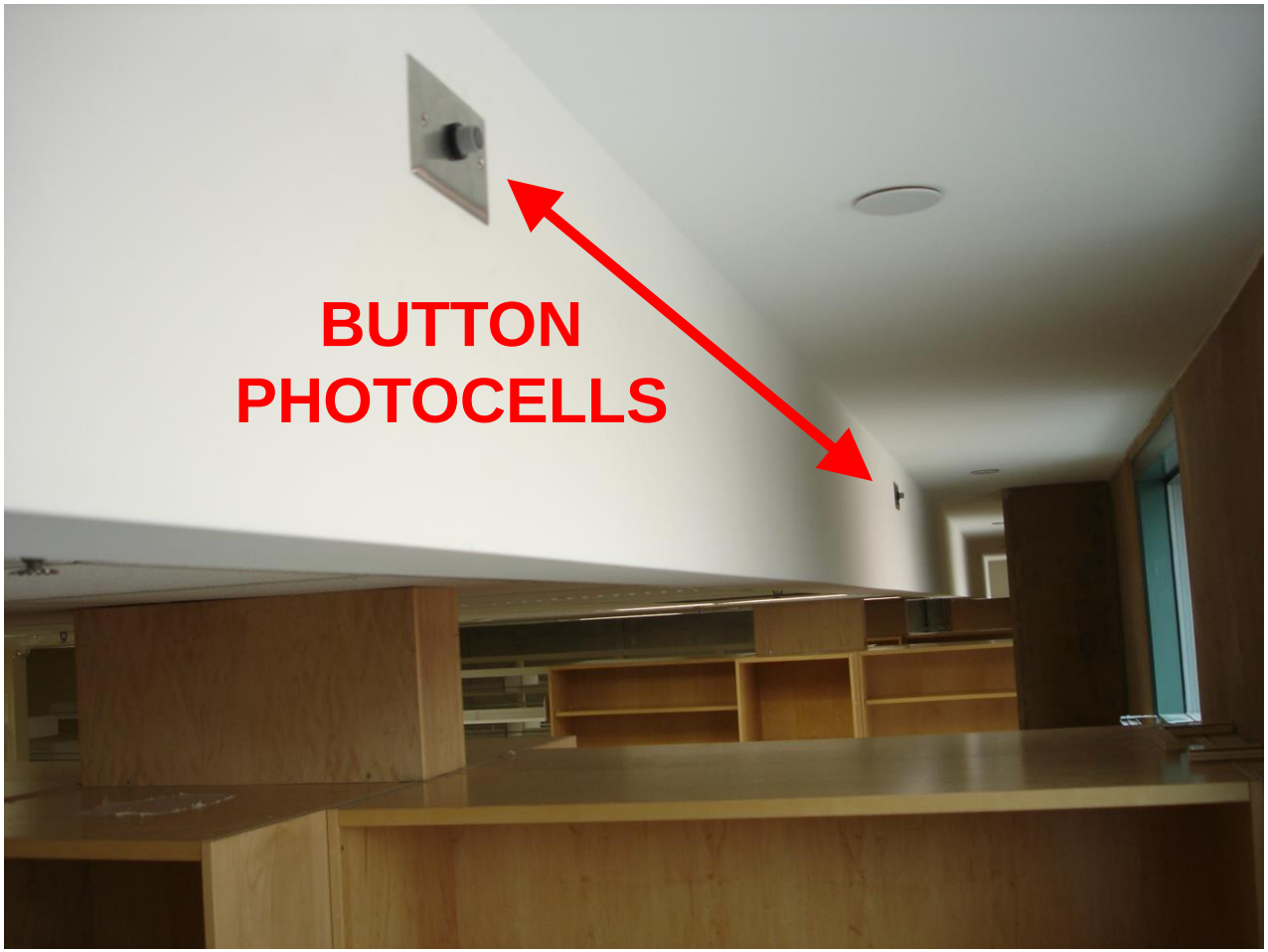
Auto on to 50% Light Level



Lower Blinds to Allow for Daylighting

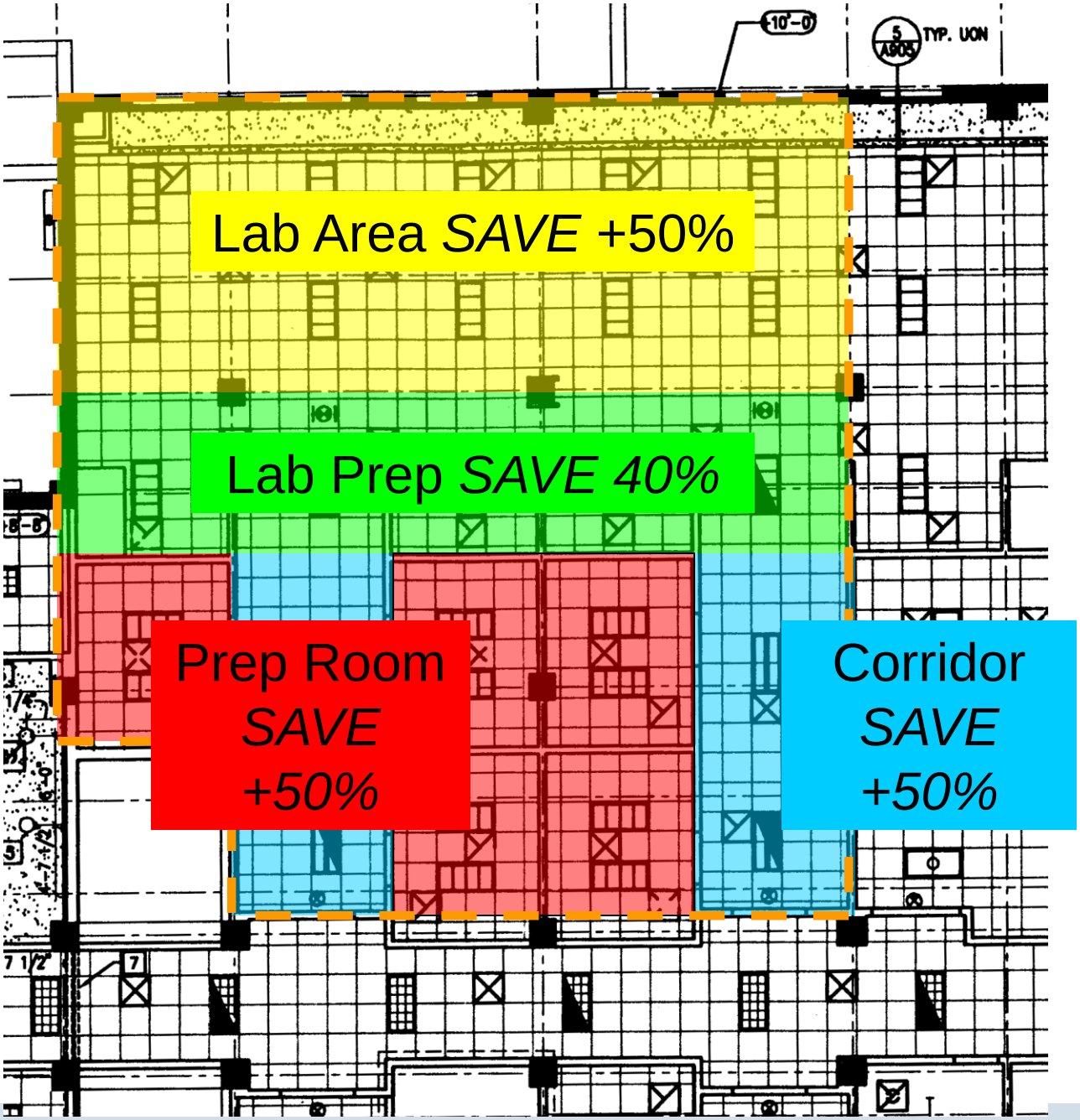


Photocell to Control Window Fixture



Fixture Closest to the Window is OFF

AFTER


Lab Area *SAVE* +50%
Lab Prep *SAVE 40%*
Prep Room *SAVE +50%*
Corridor *SAVE +50%*

Summary

- Project Is Scalable (floors, buildings, campuses)
- Simple Payback Period in the 2.3 to 3.4 year range
- Savings Based on Controls not LPD!
- Consider under cabinet task lighting at the work surface to augment overhead lighting
- Consider perforated blinds to increase light and reduce glare through “views” portion of fenestration

LIGHTING

1. Lighting should be as flexible as the possible
2. Provide task lighting when additional illumination is needed
3. Encourage occupants to be conscious of their lighting needs
4. Do not discount the synergistic savings of heat produced by over illuminated spaces

LIGHTING

Previous Best Practice	Space Type	Gross Hall
0.9 watts/sqft	Offices	**0.49** watts/sqft
1.1 watts/sqft	Labs	**0.66** watts/sqft
1 watts/sqft	Overall Conditioned Space	**0.61** watts/sqft

208,561 kWh/year

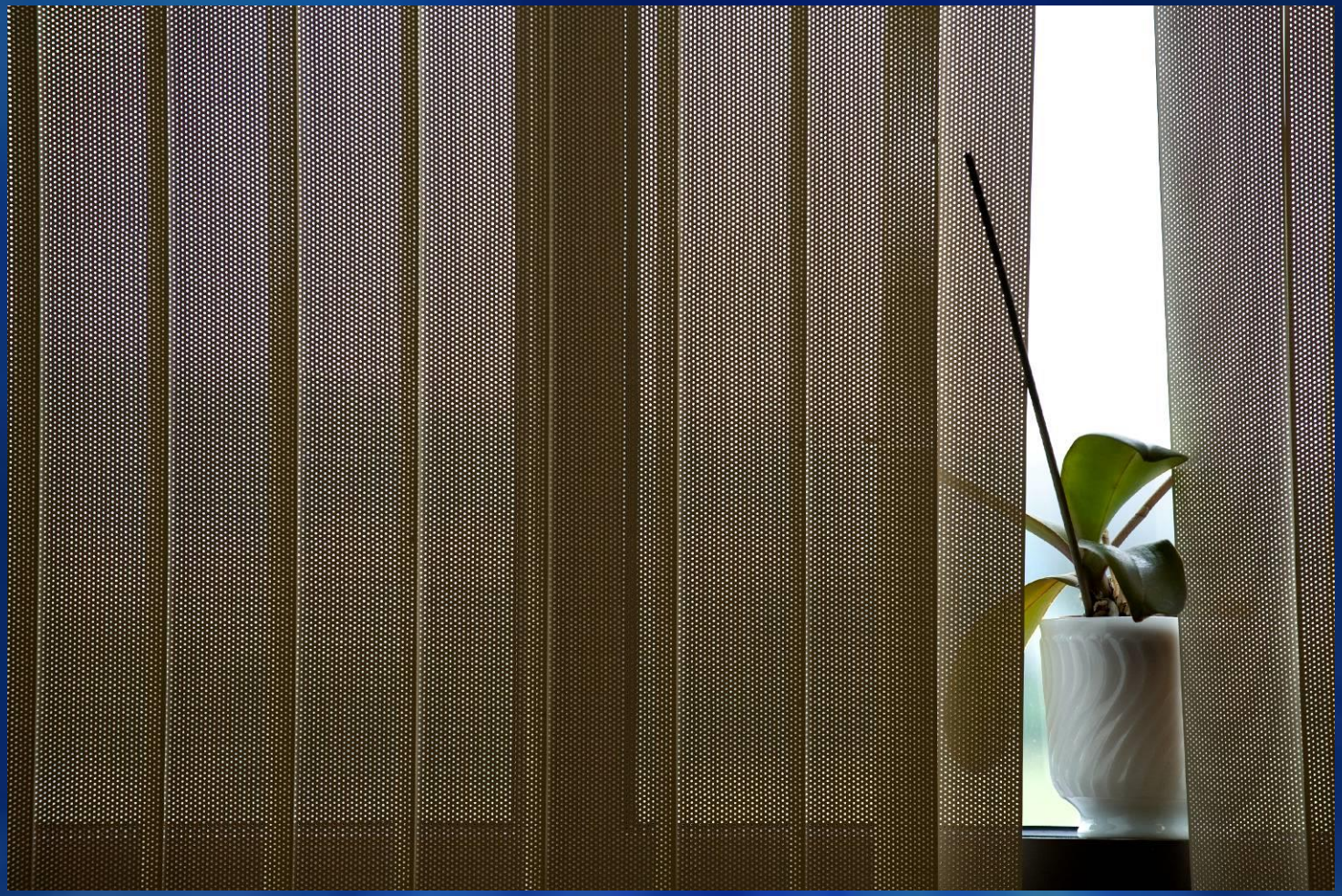
94,753 kWh/year

Results in a savings of $11,897 per year at $0.105 per kWh

LIGHTING

Perforated Window Blinds

Make use of daylighting without the glare



LIGHTING

Lab areas within 15’ of the window line and all private offices and conference rooms are equipped with automatic daylighting controls

LIGHTING


OPEN RESEARCH LAB
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FOR REFERENCE ONLY, SUBJECT TO CHANGE WITHOUT NOTICE

LED Task Lighting