

1. PHOTOMETRIC DATA CALCULATIONS

- a. PERIMETER (P) – *Total Distance Around a given space*

$$P = A + B + C + D$$

- b. AREA (A) – *Length (L) times Width (W) of a given space.*

$$A = L \times W$$

- c. LIGHT LOSS FACTOR (LLF)-

LLD = Lamp Lumen Depreciation (provided by Mfgr)

LDD = Luminaire Dirt Depreciation (provided by Mfgr)

CU = Coefficient of Utilization (Provided by Mfgr)

$$LLD \times LDD = LLF$$

- d. LAMP LUMENS – *Initial per Luminaire*

$$\text{Lamp Lumens} \times \# \text{ Lamps per Luminaire} = \text{Total Lumens per Luminaire}$$

- e. FOOTCANDLES (FC) – *per Luminaire.*

$$\frac{\text{Fixture lumens} \times \text{CU} \times \text{LLF}}{\text{Area of Space}} = \text{FC per Luminaire}$$

- f. AVERAGE LUMINAIRE LEVEL (ALL)

$$\text{FC per Luminaire} \times \# \text{ Luminaires in Space} = \text{Average Luminaire Level (ALL)}$$

- g. CEILING CAVITY HEIGHTS (Hcc)

Hcc = Distance from Ceiling to Fixture

- h. ROOM CAVITY HEIGHT (Hrc)

Hrc = Distance from Fixture to work plane or Floor Cavity height.

- i. FLOOR CAVITY HEIGHT (Hfc)

Hfc = Distance from Floor to the work plane.

2. RETROFIT FORMULAS

- a. **Watts Saved = Wattage Existing System – Wattage of Proposed System**

- b. Annual Dollars Saved

$$\frac{\text{Watts Saved} \times \text{Annual Burn Hours} \times \text{kWh rate}}{1000} = \text{Total \$ Saved}$$

- c. Return on Investment (ROI)

$$\frac{\text{Annual Savings}}{\text{System Cost}} = \text{ROI}$$

- d. **Simple Payback (yrs.) without Utility Rebate**

$$\frac{\text{System Cost}}{\text{Annual Savings}} = \text{Payback (yrs.)}$$