

**City of Hayward Green Building Checklist
for Private Non-Residential Development**
Applies to all non-residential projects that exceed 1,000 square feet

Energy Efficiency

- Energy Measure 1:**
Provide an on-site photovoltaic system capable of supplying power for 15% of the lighting load.
- Energy Measure 2 (alternate):**
Reduce lighting wattage per square foot by 15% below T-24 requirements.

Background: Energy Measure 1

According to the U.S. Department of Energy, buildings use about 68% of the electricity generated in the country on an annual basis. The California Energy Commission estimates that about one third of the energy used in commercial buildings is dedicated to lighting. This makes commercial lighting one of the single biggest energy users nationally. Reducing lighting power demand is an essential step in making buildings "green".

The California Energy Commission establishes the maximum allowed lighting power for commercial buildings and the city enforces this through the T-24 energy report. All designers and contractors are familiar with the process of calculating the allowed lighting power for a project.

This measure is based on *LEED Energy and Atmosphere Credit 2*. In the LEED system the renewable energy percentage is based on the total electricity demand of the building. In our version of the measure it is based only on the lighting demand since this figure has to be established as part of the normal permit process.

For certain projects solar panel installation will not be practical. For this reason we have included an alternate method of compliance. By reducing the amount of installed lighting, the project can achieve the same savings. This can work well for projects that do not have lighting needs that are near the limit set by T-24 requirements.

Design Process:

Measure 1: The design team should complete the T-24 energy report as they would normally do for any project. Based on the allowed wattage per square foot as determined by the T-24 calculations, provide a photovoltaic system that is sized to meet 15% of the allowed lighting power. For example: a 5000 square foot grocery store has an allowed lighting power of 1.6 watts/square foot. This will allow a maximum of 8,000 watts for the store. The PV system, in this case, will need to be capable of providing at least 1,200 watts (15% of 8,000).

Measure 2 (alternate): This alternate measure can be used if a PV system proves to be too costly or not practical. The lighting designer will need to determine the *allowed lighting power* for the space and then install 15% less. Using the same example above, a 5,000 square foot grocery store will be allowed 8,000 watts of lighting power under T-24. The installed lighting under this option will need to be a maximum of 4,250 watts (a 15% reduction).

References:

- LEED EA Credit 2
- California Energy Commission
- California Green Building Code

Water Conservation

- Water Measure 1:**
Reduce indoor water use by 20% below baseline

Background: Water Measure 1

Reducing water use in commercial buildings is relatively easy to achieve. Technologies such as waterless urinals*, occupant sensors and ultra low-flow toilets are available and provide instant savings. This measure is based on the LEED Water Efficiency Credit 2. In the LEED system additional credit is given for a 30% reduction as well. For the Hayward ordinance it will probably be sufficient to start with a 20% reduction initially and see if a higher threshold is appropriate at a later time.

***Waterless Urinals:** These units utilize a trap insert filled with a sealant liquid instead of water. The lighter-than-water sealant floats on top of the urine collected in the U-bend, preventing odors from being released into the air. Although the cartridge and sealant must be periodically replaced, the system saves anywhere between 15,000 and 45,000 gallons of water per urinal per year.

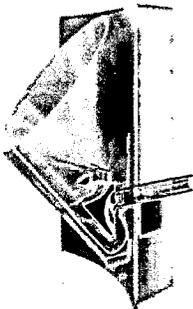
Design Process:

Water Conservation Measure 1:

The design team will need to determine the baseline use for the building per the California Plumbing and Building Codes as they would for any project. They will then need to calculate the total daily usage based on minimum code requirements. Through the specification of water efficient fixtures, a 20% reduction in total water use below the baseline will need to be proven.

References:

- 2007 California Plumbing Code
- LEED Reference Manual
- LEED WE Credit 2 (20% reduction below baseline)



Example of a waterless urinal