



Executive Summary:

The following is a technical report concerning the current conditions of the lighting system within the Tahoe Center for Environmental Sciences (TCES). Four spaces were analyzed: the lobby/prefunction area, the case study classroom, the chemistry lab, and the exterior facade. AGI 32 v1.8 was used to determine existing illuminance levels and examine rough images of what the space might look like were it built today. Information for materials and their reflectances was obtained from the specification sections and the drawings, and light loss factors for all light fixtures were obtained using standard IES procedures.

The existing conditions were found to be adequate in most cases. ASHRAE 90.1 was only exceeded in the chemistry lab, and the IES recommended illuminance levels were adhered to fairly well. The only exception being the chemistry lab, where it was overlit. Although this overlighting can be attributed to the fine and sometimes dangerous tasks performed in chemistry labs, a similar level of light could possibly be achieved using a different lighting approach that meets ASHRAE 90.1 requirements.

Overall, it was determined that the lighting system in TCES needs to be versatile enough to handle multiple uses. Many of the spaces serve different purposes and as such will need to be lit in such a way that they can be functional in a variety of different situations. This must be done with energy efficient design in mind since TCES is currently slated to be a LEED platinum project. Some methods that were found to possibly reduce energy were switching to more efficient sources (linear fluorescent instead of compact fluorescent) and bringing light directly to where it is needed to avoid over lighting a space (such as task lighting in the case study classroom). Furthermore, it was determined that several of the spaces would benefit from daylight studies to see if a further reduction in energy use can be achieved.

From the analysis, a broader understanding of how the current lighting system within TCES operates, where it has its strengths and where it can use improvement was gained. Using the design criteria generated, along with the analysis of each individual space, a different and hopefully superior lighting system can be designed to meet the tenants needs.