



Bringing quality
to the
built environment

Task Lighting Effects on Preferred Office Lighting and Energy Savings

Objectives

To evaluate whether task lighting in offices will reduce occupants' preferred ambient lighting level, leading to savings in office lighting load.

Background

Many recommended practices claim that savings in lighting energy and peak electrical load of up to 40% can be achieved by reducing ambient lighting levels in offices and using task lighting of much lower wattage. Previous research on this topic is equivocal, and does not reflect modern North American office conditions, tasks, or cultural expectations. Therefore, there was a need to test the appropriateness of task-ambient lighting solutions to avoid possible satisfaction-related problems.

Statement of Work

The research was conducted in a full-scale mock-up office containing two open-plan workstations. Ambient lighting was provided by dimmable ceiling-recessed deep-cell two-lamp parabolic troffers. One workstation had an angle-arm desktop light fixture and the other a table lamp with luminous shade. The task lights were set at various levels of output (including zero) and research participants chose their preferred ambient light level in response to the task light setting.

Results

- Participants did not dim ambient lighting substantially when given task lighting. This is likely because people want adequate lighting on all room surfaces, and comfortable luminance ratios between room surfaces. This suggests that pursuing large energy savings by cutting back considerably on ambient lighting and providing a task light may backfire in the long-term by creating sub-optimal lighting conditions.
- Current recommended practice for ambient lighting on the desktop of 400-500 lx is appropriate based on average occupant preferences. However, recommended practice for vertical partition illuminance should be revised upward, to 200-250 lx.

Outcomes

- Report containing the results and implications for achieving energy savings in practice
- A scientific journal article
- Technology transfer to practitioners

Partners

Climate Change Plan for Canada, Technology and Innovation R&D Initiative (CCTI), BC Hydro Power Smart

Start/Completion Dates

The project began in March 2003 and was completed in July 2004.

Project Manager

Dr. Guy R. Newsham: 613-993-9607; Guy.Newsham@nrc-cnrc.gc.ca

For more information, see http://irc.nrc-cnrc.gc.ca/ie/lighting/office/tasklighting_e.html

Factsheet 37, May 2005



Task lighting provided by lamp with luminous shade