



Bringing quality  
to the  
built environment

## Lighting Quality and Office Work: Field Simulation Experiments

### Objectives

To conduct two experiments in a simulated office environment to verify the benefits of good office lighting on task performance and well being of occupants, with and without individual controls.

### Background

Past research from both IRC and our collaborator, the Lighting Research Center at Rensselaer Polytechnic Institute (LRC), established that good quality lighting design can improve occupant satisfaction and task performance, while being energy efficient. Although market research had shown that decision-makers will chose lighting products that improve employee satisfaction, health and productivity, they lack specific information about which products or lighting designs to choose. To answer these questions for the industry, IRC and LRC together conducted two experiments in a commercial office building furnished as a typical open-plan workplace for nine workers.

### Statement of Work

The experiments compared the effects of various types of currently available lighting equipment, making sure to include most types commonly used in North American offices so that the results would provide meaningful guidance to those who make decisions about lighting.

### Results

The results of both experiments showed that people who are more satisfied with their lighting rate the space as more attractive, are happier, and are more comfortable and satisfied with their environment and their work. Although there were few direct effects of lighting design on task performance, the results provide guidance on how to improve satisfaction with office lighting: Lighting designs typical of current practice, using fully direct luminaires, were rated as comfortable by 70% of participants, direct/indirect systems by ~80%, and direct/indirect systems with individual control by ~90% of participants. Further, on average, people with dimming control chose lower illuminances than current recommended practice, implying the potential for energy savings.

### Outcomes

- Detailed report of results indicating the response of the participants and their performance
- Papers in journals, conference proceedings and industry magazines

### Partners

Light Right Consortium (managed by Pacific Northwest National Laboratory [operated by Battelle Memorial Institute for the U.S. Department of Energy]), <http://www.lightright.org/>

### Start/Completion Dates

The project began in 2001 and was completed in December 2003.

### Project Manager

Dr. Jennifer A. Veitch: 613-993-9671; [Jennifer.Veitch@nrc-cnrc.gc.ca](mailto:Jennifer.Veitch@nrc-cnrc.gc.ca)

For more information, see [http://irc.nrc-cnrc.gc.ca/ie/lighting/office/officework\\_e.html](http://irc.nrc-cnrc.gc.ca/ie/lighting/office/officework_e.html)

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Office with individually controlled lighting (dimming control)