Daylight & Glare

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ABSTRACT

We conducted a daylighting and glare study for Bora Architects within their Portland business office space. The project was to examine the quality of daylight, consider the effectiveness of borrowed light, and strive to discover what LEED-compliant daylight autonomy really looks like. In addition we were tasked with running computer simulations to measure excess glare and look for ways to combat its effect. We were able to explore the effects of glare within Bora’s workspace as it currently exists and look for interventions to improve perceived lighting level contrasts. The control of glare and daylighting can be an effective internal strategy to maximize visual comfort and reduce energy use. Our goals for investigating the current daylight conditions within Bora’s office spaces included using a variety of tools to measure light and glare, including Diva for Rhino, Sefaira for SketchUp, IpiX for (IPhone) and a light meter. We conducted various “rounds” of site observations and measurements within two key areas of Bora’s office space, including a conference room, as well as, an individuals typical work space.

Results/Findings

Analyzing existing lighting conditions through Diva’s parametric design process offered immediate insight into the effects of current lighting levels. The simultaneous collection of field data allowed us to translate the real world experience of the space in reference to digital modeling. It was our aim to find balance between optimum day lighting levels, while keeping glare levels to an acceptable range. It was our experience that Diva for Rhino is a more optimal and useful tool for this type of data collection than Sefaira for SketchUp. We have discovered that it is certainly possible to use Diva as a design tool, design in order to express veracity to customers and clients seeking this level of detail and attention in the design process. Unfortunately, we discovered that adequate daylight comes at the cost of increased glare. Initial research suggested that changes in glazing and additional louvers could be added to help maximize daylight while simultaneously reducing the effects of glare. Additional research could be collected to determine more effective and creative ways to combat these conditions.

Daylighting Visualization

Mike Manzi | Abby Dacy | Jacob Peel

Architectural Technology
Sergio Palleroni | David Posada | Tucker Jones

Daylighting Visualization

Alyssa Brook | Jennifer Moran | Chad Wallace

PSU: School of Architecture, Graduate Students

ARCH: 560: Advanced Architectural Technology

BORA Architects

720 SW Washington St. #800
Portland, OR 97205

Architects

Morgan Building

Architects & Interiors

Test Spot #2

Conference Room

Blue lounge

Test Spot #1

Work Space

Floor, Floor, Floor,