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Evaluating the Impact of Glazing Orientation on Daylight Penetration Using Autodesk Insight

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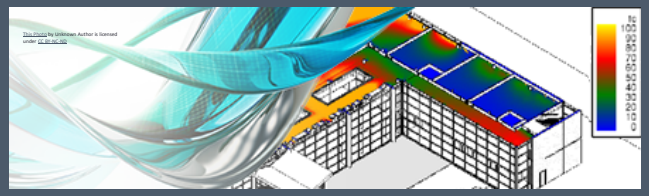


Evaluating the Impact of Glazing Orientation on Daylight Penetration Using Autodesk Insight

Randy Mueller, Portland State University with contribution from Scott Mooney, SRG Architects

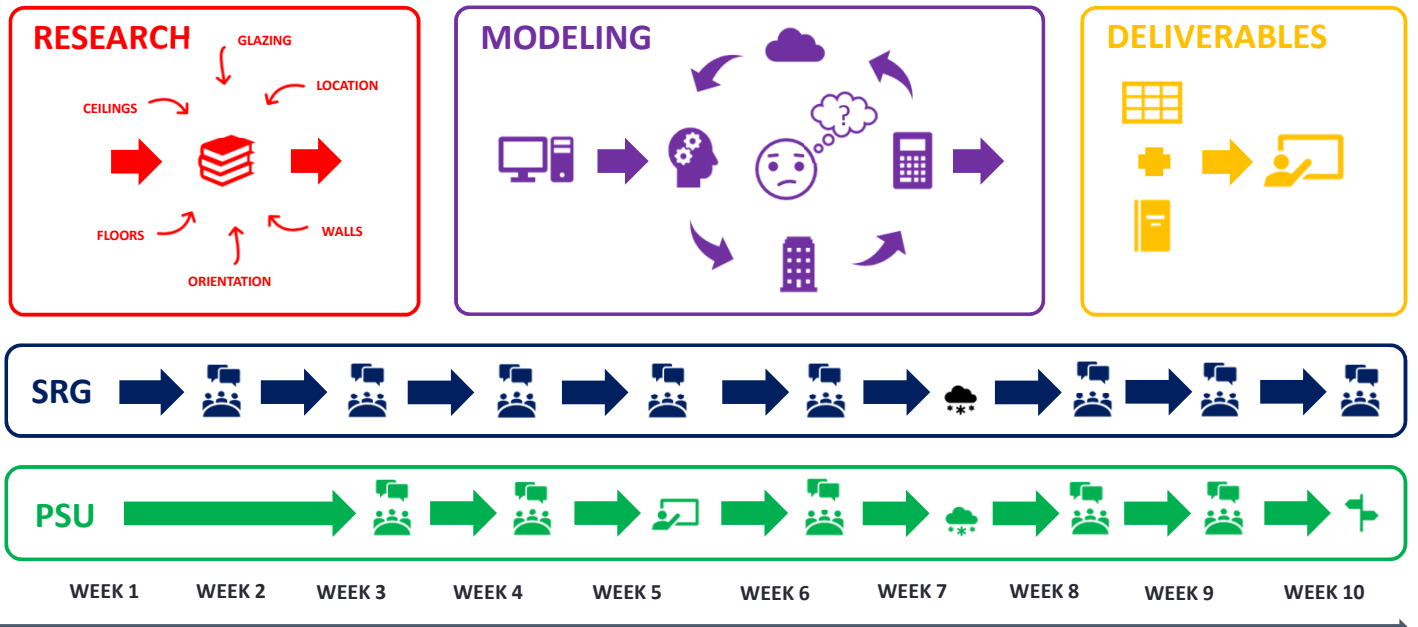
ABSTRACT

The objective of this research project was to evaluate how glazing orientation impacts daylight penetration into a building. A Revit shoebox model of a room containing glazing on a single wall was constructed and Autodesk Insight was used to perform the daylighting analysis. Maximum daylight penetration was achieved when the model was analyzed with glazing orientated toward the east or the west. However, northern and southern glazing orientations produced a more consistent and uniform distribution of daylighting throughout the room. The results demonstrate the importance of glazing orientation when incorporating natural light into a building design.

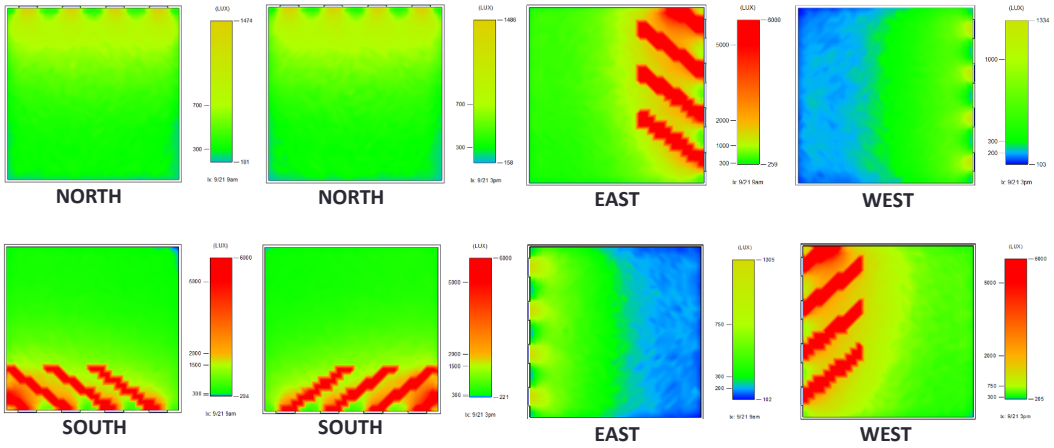
METHOD

Using a one-room, shoebox model constructed in Revit, a daylight analysis was performed using Autodesk Insight. Illuminance measurements were collected at 9 am and 3 pm for the four cardinal directions.

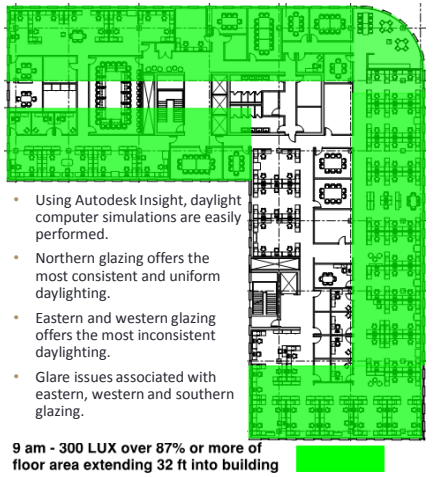
COLLABORATION TIMELINE



RESULTS



CONCLUSION



- Using Autodesk Insight, daylight computer simulations are easily performed.
- Northern glazing offers the most consistent and uniform daylighting.
- Eastern and western glazing offers the most inconsistent daylighting.
- Glare issues associated with eastern, western and southern glazing.

9 am - 300 LUX over 87% or more of floor area extending 32 ft into building

- Results of daylighting analysis can help optimize floor layouts, minimizing use of artificial light and maximizing visual comfort.
- Autodesk Insight offers automated settings that can be selected when achieving LEED credit, streamlining the documentation process.

3 pm - 300 LUX over 87% or more of floor area extending 32 ft into building