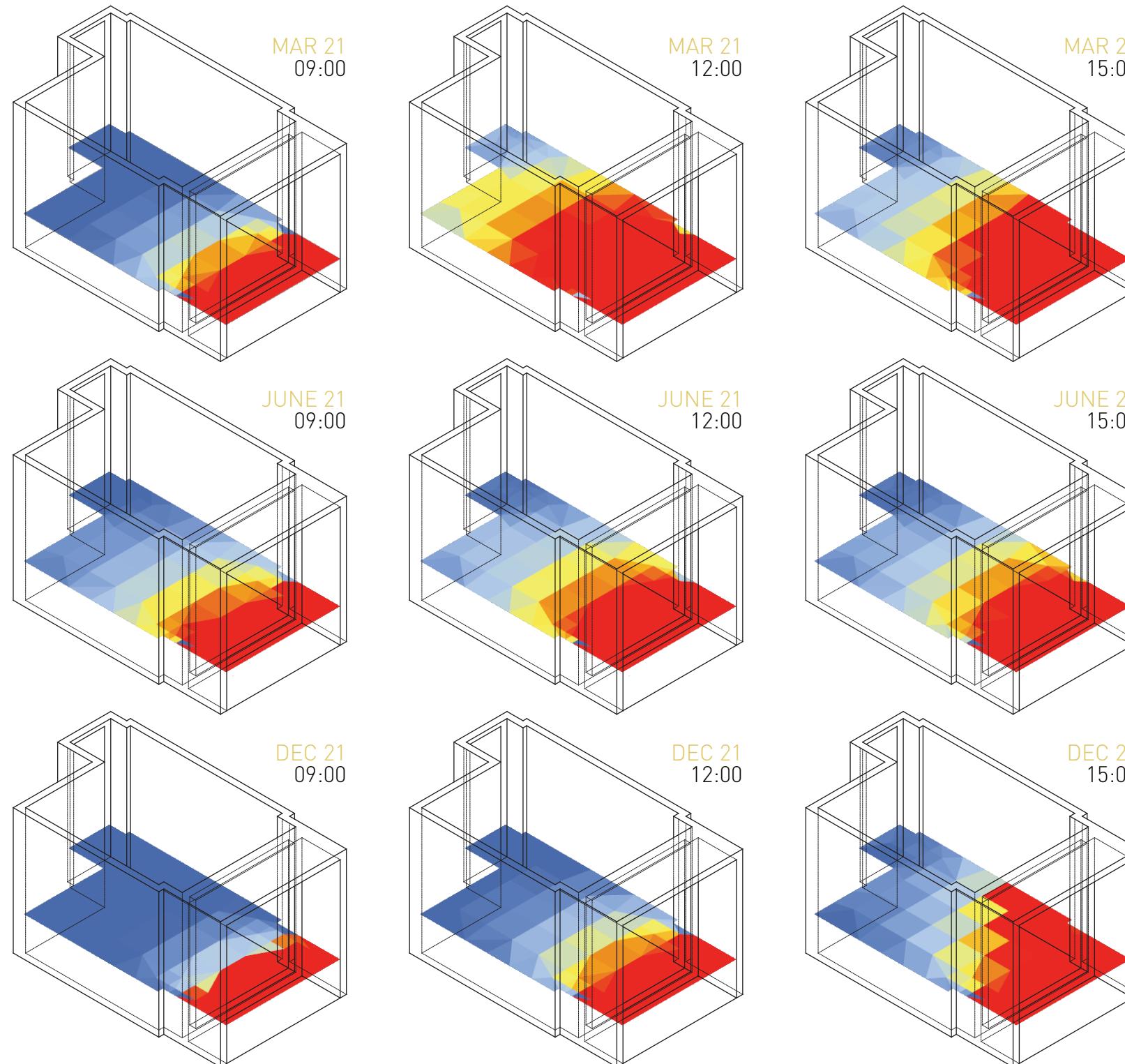
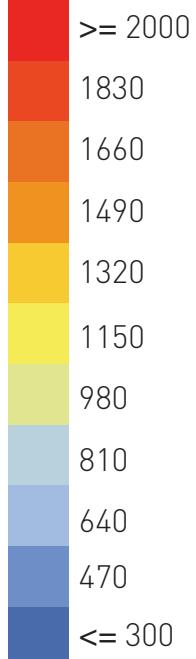


Daylight Analysis

illuminance (lux)



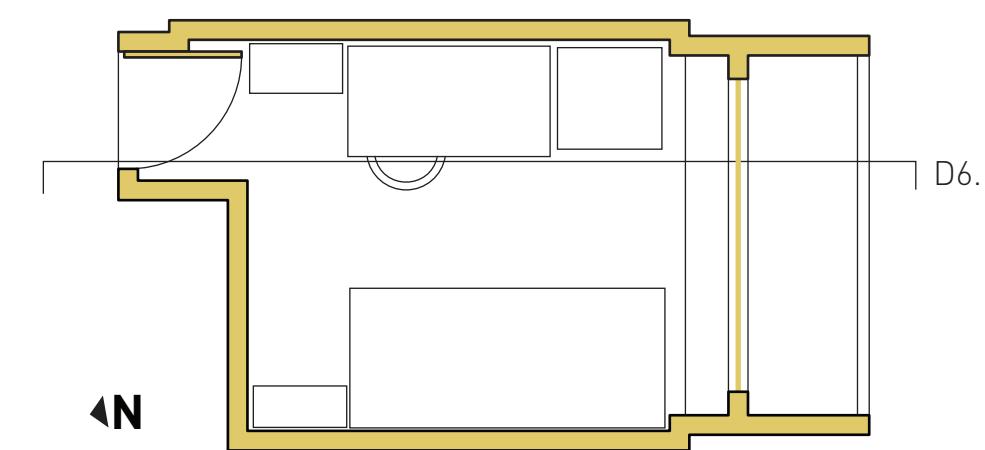
ANALYZING DAYLIGHT QUALITY

To illustrate how much daylight comes into this space, a 3d model of the space is constructed out of surfaces, distinguishing window material from opaque material; then using Ladybug and Honeybee in conjunction, skies are simulated for the location (Philadelphia) and tested with the 3d model for a specific set of days and times in order to evaluate the existing daylight quality of the base case. The existing daylight quality of the base case can be seen in the charts on the left; values over 2000 lux implies potential glare and values below 300 implies a lack of daylighting.

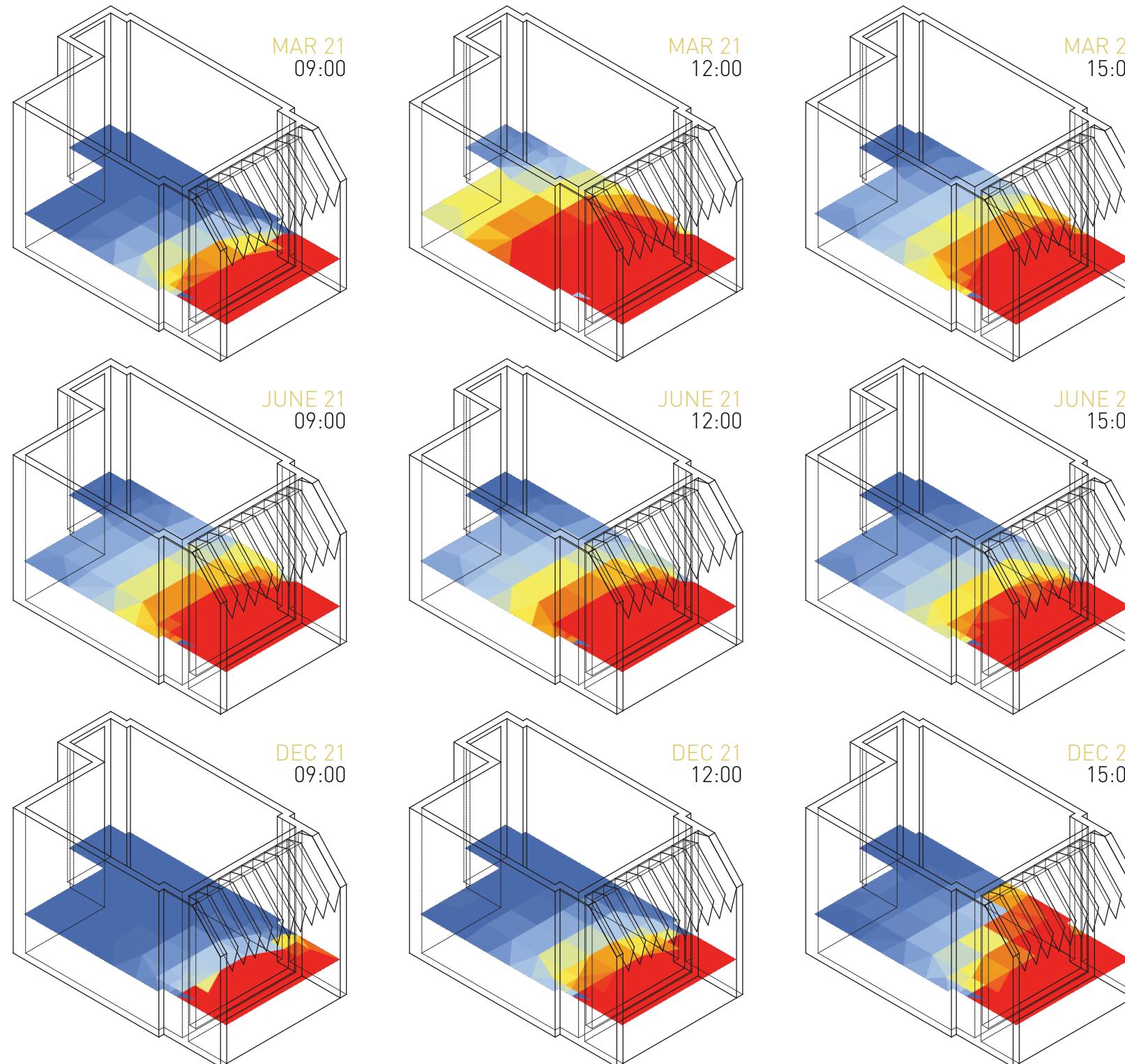
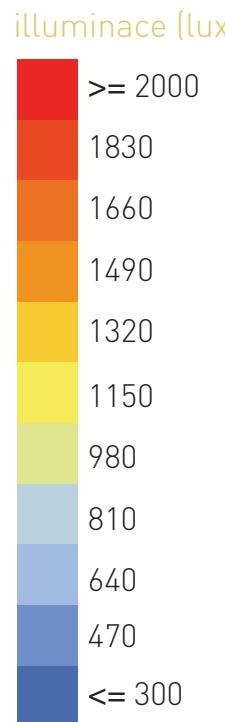
QUALITY EVALUATION OF BASE CASE

For this evaluation, the balcony will be negated to focus on the quality of daylight experienced while one might be working on a computer as the standard activity.

Seeing as there is coverage about 3 feet past the window on all sides (the balcony walls, ceiling and floor), much of the June sun intensity has been toned down for the interior, since the location of the sun, with respect to Philadelphia and the season, is almost directly above. More problems due to daylight would be experienced during March and December, since the position of the sun makes for more direct contact. The focus of the shading design adjustments will be to decrease the amount of incoming daylight that happens on March and December afternoons in order to optimize the experience of working on a computer at the desk (as seen in plan below) and reduce glare.



Daylight Analysis - Shading Implemented



CHANGING DAYLIGHT QUALITY

The shading device designed to optimize computer work at the desk in the room is essentially a set of angled panels that go from the top of the balcony ceiling to about 2.5 feet above the existing guardrail (can be seen in the section below). The lowest points of these panels are determined such that the view of the outside from the room and the balcony might not be jeopardized. These panels are not parallel to the balcony walls but are rotated on an angle to allow daylight to pour in towards where the bed is, but not where the desk is.

As a result, less potentially glaring daylight would affect the desk area during the afternoons in March and December, compared to the base case. While the effects of this shading method help with potential glare (especially at 15:00 on March and December), it fails to remedy the blaring sunlight that enters at noon on March.

