

**Jon Braddock**

## **Studio 5 Lighting Strategy**

Studio 5 in the architecture department at MIT is a space of average natural light capacity. It is located on the top floor of a four story building and has north east facing windows that emit indirect light and reflections during the day from surrounding buildings. The space is also broken up into 5 bays that each contain a large number of working desks, computers, cutting stations, printers, and floating pin up walls. Everything in the studio is painted white except for the trim around the desks and pin up walls and the color accounts for 75% of the studio's light transitivity. The surfaces in the studio are concrete, terrazo, wood, plastic and homosote; all of which contribute to an interesting plethora of light patterns and reflections and consequentially a lot of deep shadows and pockets of darkness during the day.



The area of most concern in this studio is along the central access route. It is framed by floating partitions, columns and neatly arranged computer terminals that in their own way block a lot of the light from being distributed throughout the studio. The students desks are divided by this corridor so one half of the studio gets natural light in the morning and the other gets indirect light in the afternoon.

The problem in this studio is how to distribute more natural light into the space with out:

1. Interfering with existing infrastructure
2. Disrupting the overall layout of the space.

To begin, it was imperative to isolate the areas of the studio where light seemed to be efficient and to identify how and why it was so. My conclusion was that the glass garage doors along the west side of the studio were the very best at light transitivity primarily due to the array of skylights that lined the corridor outside. These skylights allow for indirect lighting to bathe the white painted corridor space that runs parallel to the studio and penetrate the glass doors, thus creating an area of comfortable visibility and extreme clarity where it matters most. The key here was to create a device that would maximize the light in the corridor and bounce it into the studio so that it would reach the inner corridor that currently suffers most.

My proposal was to integrate a series of angled reflective panels under the sky lights and floating mirrors on the ceiling of the studio to transmit and bounce light into the space. In order to maximize this condition, the panels had to be aligned with the mirrors, and hanging far enough down to achieve the desired effect in the studio with out compromising the head height along the corridor. It was also important to adjust the angle of the panels to eliminate glare and to think about the corridor as a linear space of reflective mirrors disguised as

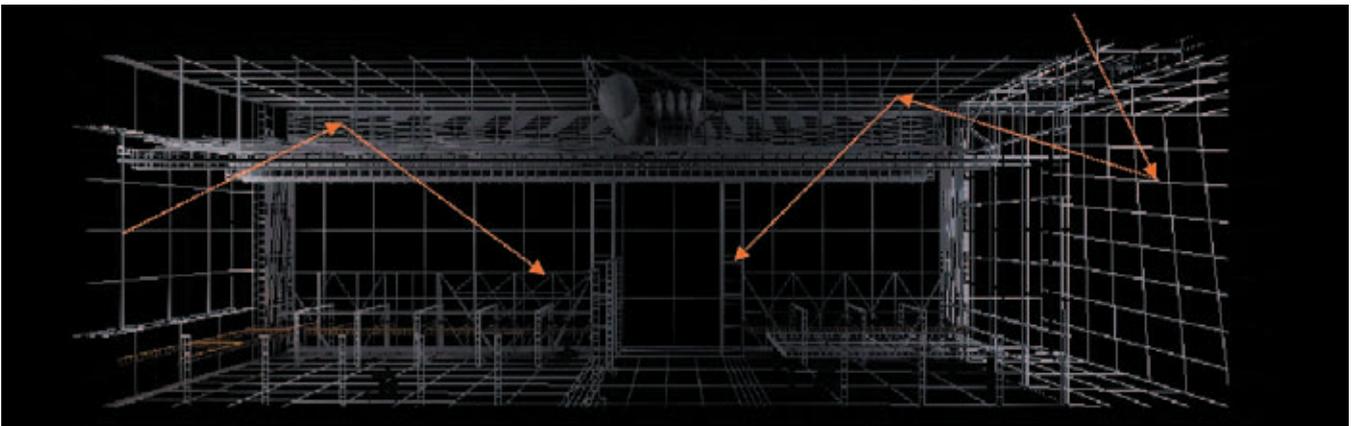


sculptural panels.

Using Lightscape as a tool for analysis, it was important to run several simulations of existing and proposed conditions at two times of the year: June 21 (Summer Solstice) and December 21 (Winter Solstice). Each day was significant in identifying the behavior of the light on the longest day of

the year as well as on the shortest day. Six studies of each day were simulated: 9AM, 12Noon, and 5PM. The times were significant in that they provide a variety of lighting conditions with which to compare conditions with and to track the intensity of the sun throughout the day.

At the conclusion of the study, it was obvious that the panels would contribute significantly to the overall light distribution of the corridor as well as produce the ambience necessary to create a comfortably lit studio space on the inside. The drawback however was that the size and angle of the panels mattered more than expected in order to achieve a consistent stream of light during the day. In response to the latter, more reflective surface was placed around the opening of the skylight in an effort to capture as much light as possible and to maximize the light at its source instead of trying to take advantage of its intensity so far away. The observations following the addition proved to be more brightness at the top





near the skylights - as expected- and more glare along the corridor due to the shininess of the floor.

In conclusion, the corridor proved to be a potential space to take advantage of light. The test would have been more successful if a panel(s) were to be angled in several directions as a tool to respond to the changing directions of the sun during the day. Also, if the panels were built to house the existing artificial lights (that are small enough to be concealed) for ambience at night. Overall, the studio benefited from this addition and it was a viable experiment that it indicated how flexible the conditions are for change as well as how strong light can be when the proper strategies are implemented.

