

# The Affects of Virtual Light in Aalto's Tallinn Art Museum

by Aaron Lehr

The Tallinn Art Museum by Alvar Aalto builds upon previously completed projects such as the Viipuri Library and Helsinki Institute <sup>[1]</sup>. The luminous interaction of light and space is an important design aspect in these projects. Consequently, my digital representations of the Tallinn Art Museum narrate this unbuilt space by using a play of light and architectural detailing. An unbuilt project is always difficult to imagine and discuss in a realistic situation. To mitigate this situation, I created a virtual building that allows one to see how light affects the internal and external spaces. A physical model is less capable of displaying effects of realistic lighting. The addition of light allows a person to see how walls, windows and doors create a realistic space by representing light traveling through the interior space. By using 3D rendering software such as **form•Z**, I am able to pinpoint the natural lighting of the sun and artificial lighting of incandescent lights to visually express the architect's intent.

The software tools allow for a precise positioning of light sources to represent a variety of lighting situations within a building. In a natural setting, there is a dominant light source, the sun, as well as smaller and less powerful artificial light. In a physical model, one cannot see the changes

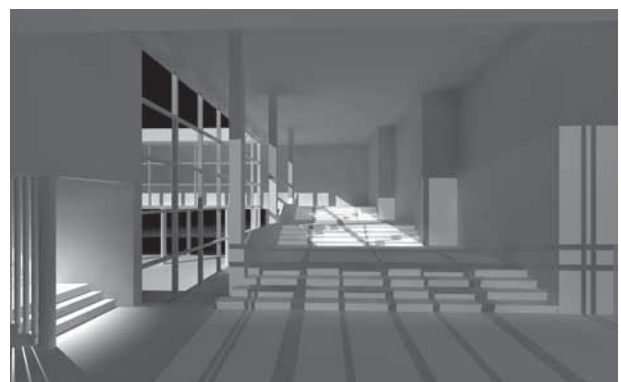
in illuminations during the different times of day. However, the virtual model allows me to use geo positioning of the site to accurately identify the effects of sunlight throughout the day. This gives me an advantage over traditional physical models by allowing me to know where the sunlight will enter the building and illuminate the interior space.

When I produced lighting scenarios for Aalto's Tallinn Art Museum, I used dark and light areas to move the viewer's eye through the building. In the image of the main lobby, I used an omni light in the back of the courtyard to create a bright area where the second floor courtyard meets the solid wall of the lobby; this effect creates an area of contrast leading one's eye to the rear of the picture.

Another effect that can be created with light is laying different shadows over each other. In the lobby image (Figures 1, 2), I used a less intense omni light behind the support columns, which casts light shadows down the stairs and along the lobby floor. The lobby floor is a unique woven brick pattern, sometimes described as a beehive brick pattern (Figure 1) shown in Aalto's perspective drawings <sup>[1]</sup>. I used another artificial light to accent the architectural details of the columned wall producing shadows that mim-



**Figure 1:** An entrance hall with a view of a courtyard.



**Figure 2:** An entry sequence. The image matches Alvar Aalto's original design sketch.

icked those on the lobby floor. This columned wall detail can be seen in Aalto's built projects, such as Villa Mairea and the Technical University of Helsinki [2]. Using a different intensity and amount of light brings the viewer into the space and creates dynamic lighting situations accenting the architectural details. Aalto did not provide information in which I could base the placements of lighting fixtures; therefore, I used lighting that would explain the physical space of the building rather than placing actual lighting fixtures distracting from the building's architecture.

Within Aalto's concept design of the Tallinn Art Museum, there are several different ways in which natural light enters the building. The sunlight enters through the curtain walls in the courtyard as well as via the front entrance facade. In addition, a significant amount of natural light enters from the round skylights penetrating the roof, creating a play of shadow and light in the courtyard image. One can see the combination of the light, which enters through the circular skylights and the curtain walls. The skylights and curtain wall were design ideas that can be traced through Aalto's built projects from the Viipuri Library to Helsinki Institute [2].

Along the courtyard, the bright lights of the curtain walls create a lively contrast between light and dark areas in the interior spaces. The doorway also frames the viewer's eye to be pulled down the stairs into the entrance lobby (Figure 4). I created this focal point by using a series of lights combined with Aalto's architecture.

In effect, my renderings are produced to display a variety of dynamic light conditions to show the Tallinn Art Museum concept as a physical space (Figure 3). The unbuilt Tallinn Art Museum provided an opportunity to study the effects of sunlight and artificial light on a building. Aalto's use of light in similar buildings allowed me to imagine how the lights would play in the unbuilt structure; whereas, the 3D rendering software allowed me to provide an image for others to view how I imagined the effect of light within the virtual building.



Figure 3: A museum hallway focusing on an interior courtyard.

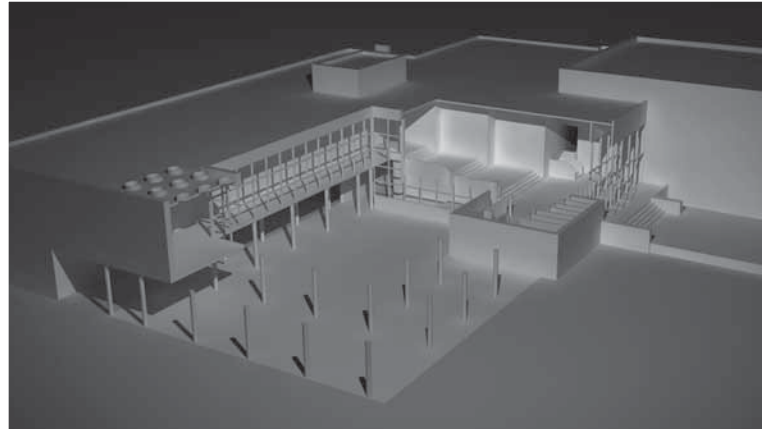


Figure 4: The sectional perspective illustrating the building's circulation and organization.

## REFERENCES

- [1] Paul David Pearson, *Alvar Aalto and the International Style* (New York: Whitney Library of Design, 1978).
- [2] Richard Weston, *Alvar Aalto* (London: Phaidon Press Limited, 1995).



**Aaron Lehr** is a sophomore majoring in interior architecture at Rhode Island School of Design, refining his basic architectural ideas. Beginning in preschool, he built factories, houses or other buildings out of every cardboard box available. Today, he continues to enjoy the idea of adapted reuse and is fascinated with the idea of recycling a structure and site to produce a new project. Before entering RISD, Lehr attended a performing arts high school in Wilmington, Delaware, where he concentrated in Studio Art. Although he would have preferred to work in three dimensions, studying drawing, painting and the use of color provided a necessary base to enhance his architectural studies today. While in high school, a number of Lehr's sculptures received both local and national art awards and recognitions. Since studying at RISD, he has only been working with computer-aided design programs for a year. Lehr admits the use of digital tools intrigues him as it helps with his design work. His hope is to continue to learn how to refine his design ideas in a digital environment.