LIGHTING DEPTH

This mixed-use project is a 280,000 SF building that contains apartments, retail spaces, and office space. The building footprint rests on the corner of a busy intersection in a metropolitan area in the eastern United States.

The existing lighting systems use fluorescent, compact fluorescent, and halogen sources. The new designs will use similar sources in different luminaires and also integrate special controls where appropriate as an additional component in the system to better system performance and decrease energy costs as well. In the fitness room in particular, a daylight study will be performed to adjust interior lighting to work well with natural daylighting. In the retail space, a proposed tenant fit-out will take place (as an architectural breadth), allowing actual locations of light sources to be determined based on merchandise layout as well as special interest areas. In the courtyard, properly lighting the landscape and providing enough illumination for casual viewing and meeting tasks will be the focus. In all spaces, meeting energy code requirements will be an important concern. Occupant comfort will also be taken into consideration as part of this work.

Solution.

A break-down of the design initiatives for each space follows.

Residential Lobby. The main goals for the residential lobby deal with occupant comfort and atmosphere. A public impression will be pursued (but with subtle accents and highlights for communicating the visual hierarchy). Adequate light levels will be targets in certain areas according to tasks performed in those areas.

Fitness Room. A daylighting study will be performed to determine the feasibility of implementing daylighting controls to the space. At nighttime, the system will be required to provide sufficient lighting to the occupants, while not interfering with the courtyard scene. Intensities should not be overly bright and distributions near the window should not be directed at the windows. Glare considerations for occupants laying face-up on exercise equipment will also be a concern.

Retail Space. The lighting of the retail space will be extremely crucial in directing sufficient light onto merchandise, providing task light for employees, enhancing the new architectural features of the space, and providing contrast between circulation areas and areas which desire heightened attention. From the street, the window displays will be another important aspect of the design due to this being the “first impression” seen by potential customers. The store layout and materials will be modeled after high-end clothing stores to fit the overall theme of luxury throughout the building. Flexibility will be a strong concept in developing the lighting solution for this space and may incorporate the use of controls and/or moveable fixtures.

Outdoor Courtyard. The focus of this outdoor space will be the landscape materials – primarily the two different types of bamboo and Japanese maple trees. These will be showcased and accented to provide visual interest during the night both for the occupants of the courtyard and for the inhabitants of the fitness room (if window glare can be reduced). Enough illumination needs to be provided for viewing the ground and other people when users are circulating through the space. A balance between this light and the light from the fitness room will need to be found when the lights in the fitness room are on. Two different scenes should be rendered to determine this.

To promote the image of luxury in these spaces, careful selection of luminaires will need to take place. This will require the awareness of the specific look of each space (whether the luminaire is an important visual aspect itself or whether it should be hidden). To further promote this image, an overall clean appearance needs to be maintained with minimized clutter.

Solution Methods.

The first step in completing the design is the refinement of the conceptual phase. The professional feedback acquired at Lutron will be included to improve the understanding of concepts and help the progression of concepts into the next stages of design. Hand sketches and Photoshop renderings will be cleaned-up in this stage.

The design development stage will consist of using computer models to accurately portray the spaces three-dimensionally. Lighting fixture selection will take place here and preliminary calculations will be performed to approach target lighting levels and power densities. The results will be refined by an educated "trial and error" approach in selecting fixtures that are appropriate for the specific application. Troubleshooting the system by altering spacing and aiming angles will be another method to improve results.

The documentation stage will include the production of lighting plans, fixture schedules, product information sheets, and calculation data.

Final renderings will be produced in AGI32 to portray realistic images.

Tasks and Tools.

Task 1. Complete Schematic Design
- a) Fine-tune sketches and Photoshop renderings
- b) Add visuals to slides (luminaire photos, scene photos)
- c) Provide keys and orientation to plans
- d) Perform new research based on Lutron feedback

Task 2. Preliminary Work
- a) Production of 3D Models in AutoCAD
- b) Layout of Retail Space

Task 3. Fixture Selection
- a) Selection of appropriate luminaires
- b) Matching sources to luminaires

Task 4. First Renderings
- a) Importing the model into AGI32
- b) Importing fixtures with IES Photometric Files
- c) Calculating initial quantities of illuminance, luminance, power

Task 5. Design Review
- a) Compare calculated results to design criteria
- b) Compare aesthetics to design criteria
- c) Make changes and recalculate as appropriate

Task 6. Documentation
- a) Produce lighting plans, fixture schedules, calculation data, product sheets

b) Compose report

Task 7. Final Renderings

a) Produce final renderings of spaces including all materials, scale figures, and backgrounds