Lighting A Retail Store

The store's ambient lighting and some of its task lighting come from fluorescent fixtures tucked away in display units, soffits, and beams. The low-voltage track system provides accent light for mannequins and window displays.

Photo by Ken Martini

Making the customers and the merchandise look good

Lighting is one of those aspects of construction that typically gets little thought until the last minute, and then it's the first item to be trimmed down when the budget gets tight.

But lighting has a tremendous impact on how a small commercial project is perceived and how it works. Good lighting draws attention to the products and makes customers feel comfortable. Bad lighting draws attention to itself.

Some Basics

Whether the lighting is for a store or a home, there are three basic ways it functions.

Accent light. This is light that is specifically used to highlight objects (merchandise, art, plants, etc.). Accent lighting needs to be highly flexible if the displays change often. Track lighting or recessed adjustable fixtures are a good choice here. Try to choose fixtures that are shielded and can accommodate a louver. This will cut the glare, and keep the focus on the merchandise.

Task light. This is the light you work by. Task lighting is diverse and can include desk lamps, fluorescents mounted under kitchen cabinets, or the fixtures around the mirror in a dressing room.

The optimal task light comes between the viewer's head and the work surface. If you try to light a work surface from overhead, the person's head casts a shadow onto the work area.

Ambient light. This is the light that fills the volume of the room. It softens the shadows on people's faces making them look better, and it makes the environment more inviting. In some ways, it's the most important kind of lighting, yet it's the most frequently overlooked.

The best ambient light is bounced off the ceiling. This works only when the ceiling color is light; dark colors absorb light. There are many ways of creating this indirect light: opaque wall sconces, tortures (floor uplights, cove lighting (wall valences that reflect light on coved ceilings), pendant-hung fixtures (suspended fixtures open at the top), and others.

Track lights and recessed fixtures aren't on this list. They're fine for accent lighting, but they're lousy sources of ambient light because they create harsh shadows – the worst kind of light to make people look good.

Good lighting is particularly important to retail stores because of its ability to draw attention. Effective window displays pull customers into shops, and point-of-purchase displays attract them to different areas on the sales floor. The lighting also has to make the people look good.

Clothing stores, in particular, have found that if the lighting is complimentary to the shoppers, they sell more clothes. If the lighting is unflattering, customers tend to blame it on the garment and end up not buying.

by Randall Whitehead

Shedding Some New Light

If you've been around lighting at all, you know that what we call a lamp in this industry is a light bulb to everyone else. What you may not know is how far lamps have come in the last few years and what that can mean to lighting a commercial (or residential) space. The two basic choices -- fluorescent and incandescent -- have been joined by a third technology -- high intensity discharge -- and all of them offer tremendous refinements.

Fluorescents

The biggest change in fluorescents is the variety of colors now available. For 30 years the choice was cool white or warm white. Cool white made everyone's skin turn greenish, while warm white put out an orange/pink light that was supposed to match incandescent, but didn't. Now there are over 220 colors available.

The color of fluorescents is measured in degrees of Kelvin (often abbreviated as ∞K). The lower the degrees Kelvin, the more orange the light; the higher the degrees Kelvin, the bluer the light. At one end of the usable spectrum is incandescent light rated at 2,800∞K; at the other end is cool white at 5,000∞K. Staying within the 3,000∞K to 4,000∞K range will give you good color rendition (more faithful to how the color looks in sunlight) while still being complimentary to skin tones.

Daylight or full spectrum fluorescent lamps are often recommended because they give a good approximation of daylight. These are excellent for color matching, but because they are in the 5,000∞K range, they don't do much for skin. A compromise at 4,000∞K is better for residential or commercial work. Remember, in a retail setting like a clothing or jewelry store, lighting the people is just as important as lighting the merchandise.

Incandescents

The focus of much of the innovation in incandescent sources of light has been low-voltage lamps. Nothing beats low voltage for controlled beam spreads. A vase can become a dazzling jewel when lit with a 50-watt multimirror reflector spot or a 50-watt parabolic reflector narrow spot. Because of the relationship of the lamp to the integral reflector, these 50-watt lamps can give up to 150 watts worth of illumination.

Another advantage of low voltage is the compact size of the lamps, allowing for much smaller fixtures both in track and recessed versions.

One disadvantage of low-voltage systems is the relatively short life of the lamps. They are rated anywhere from 300 to 3,500 hours depending on the beam spread and the manufacturer. This makes maintenance costs a major factor.

Low-voltage systems also require transformers. Electricians are usually more comfortable with *integral transformer* systems because the wiring up to the fixture is standard line voltage. The disadvantage of this set-up is a higher initial cost because each unit has its own transformer. Also, each transformer has its own inherent hum; more transformer means more hum.

Transformer-remote systems run one or more fixtures off a single transformer, cutting down considerably on material costs. However, while lowering wattage consumption, you are upping your amperage, and that may require a larger gauge wire.

You also have to consider voltage drop. The furthermost fixtures in a run can end up being dimmer than the ones closer to the transformer, if they are more than 100 feet away. A good rule of thumb is to centrally locate the transformer so that all the fixtures are roughly the same distance away.

High-Intensity Discharge

The third lamp category is high intensity discharge (HID). Supermarkets are now using HID lamps, and other retail businesses won't be far behind. They are the most energy efficient lamps and have the highest lumen output. There are four basic HID technologies.

Mercury vapor. These lamps produce a blue-white light that has been used in street lamps for many years. It has poor color rendering properties on the whole, but it does make green plants come alive. As a result, you often see mercury vapor lamps used around landscaping.

High-pressure sodium. The light from a high-pressure sodium lamp is yellow-orange. They are commonly used in major roadway lighting (replacing mercury vapor), and at the top of baked goods displays in grocery stores.

Low-pressure sodium. These lamps produce an orange-gray light which turns everything the same color. It is often used for roadways and parking lot lighting where there are lots of different sources of light. But to give you an idea of how poorly it renders colors, ambulance crews at accident sites lit with low-pressure sodium lamps complain that they can't tell the difference between water, oil, and blood.

Metal halide. This is the newest kid on the block. It has the best color rendering qualities of all the HID sources and comes in color temperatures of 3,000∞K, 4,000∞K and 5,000∞K. Metal halide is being used more and more as a source of indirect ambient light in airports, hotel lobbies, and retail spaces.

The one drawback of all HID lamps is that at approximately halfway through their rated life, they shift in color. Some shift to green and some to magenta; they are rarely consistent from lamp to lamp.

Fluorescents have a similar problem. At about two-and-a-half years into their five-year rated lamp life, they produce up to 40% less light than when they were new, while still using the same amount of power. Currently, there's no way to beat this problem except to anticipate it and replace the lamps just before the breakdown occurs.

Dimming Controls

Dimming should be included as part of the lighting design because of the control it brings to the system. But dimming creates problems with some light sources.

Dimming regular incandescent sources will help extend their life somewhat, but they become more yellow the further they are dimmed. Quartz (tungsten halogen) lamps produce a whiter light (3000∞) than regular incandescent, but it also gets amber with dimming.

There's also another problem with dimming quartz. Within each lamp is a drop of iodine. When operated at full capacity, the iodine vaporizes and cleans out the inside of the lamp. If the lamp is dimmed, the iodine does not vaporize and the lamp blackens and burns out prematurely. However, burning the lamps at capacity just 20% of the time will correct this problem. For commercial situations I suggest leaving the lights on full blast on the day the place is closed and cleaning crews are working.

The best part about dimming fluorescents is that - unlike incandescents - they don't change color as they're dimmed. Until recently, however, it meant humming ballasts, lamps that flickered if dimmed more than 80%, and only being able to dim lamps that were the same length. A new system called the Hi Lume (Lutron Electronics Co., Coopersburg, Pa.) solves these problems. It has full-range dimming, no hum, no flicker, and no restrictions on how you group lamps. It isn't cheap, though - it costs about three to four times as much as a standard dimming system.

But if dimming is just too expensive for the project, there are a couple of tricks you can use in grouping switches. The first is to switch the system so that 50% of the lights are kept on during daylight hours, and the remaining lights can be turned on in the evenings. The second trick is to put the fixtures closest to the windows on separate switches so they can be turned off when the sun is shining in. – *R.W.*

A Recent Project

This last year I designed the lighting for a small, retail clothing store in Sonoma, Calif. The owners already had a very successful women's store called Champagne Taste, and wanted to create a similar version for men -- The Champagne Taste Man.

I worked with retail space planner Stephanie Cissna and general contractor Gary Reed. Cissna's challenge was to take the 60x30-foot space and come up with a floorplan that used every square inch without sacrificing its openness. Reed was saddled with a budget of only $35,000 and only two months to take it from open stud bays to completion.

The floorplan was set up on a diagonal to minimize the ``boxy'' feeling of the space (see Figure 1). The triangular areas created by these lines were assigned to storage and dressing rooms. The perimeter of the space is lined with 4-foot-wide pole assemblies for hanging clothes with shelves above or below, and a corner platform (with shelves below) that's used to mount the store's window displays. Grouped in the center of store are eight parti-

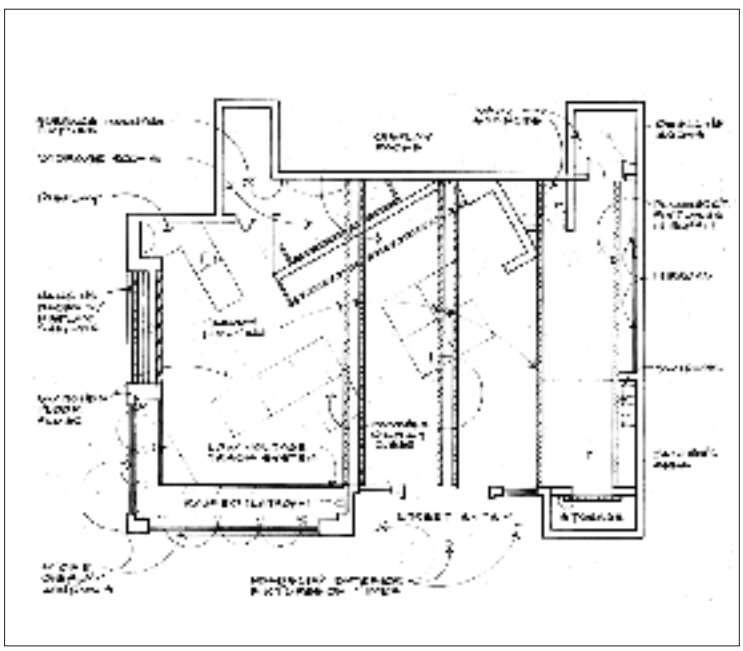

Figure 1. *The 1800-square-foot store was laid out on a diagonal with perimeter displays of shelves and hanging rods, and eight ``floating'' display cubes in the center. Different fixture types serve each area of the store.*

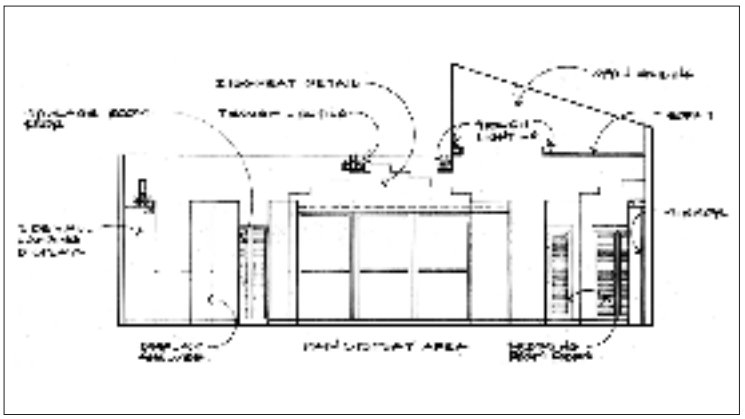

Figure 2. *This section looking toward the back of the store shows the hidden fluorescent strip fixtures. The ones concealed in the tops of the display units light the clothing below them, and also provide task lighting for the storage area behind the ``ziggurat'' detail.*

cleboard display cubes that are 3 feet on a side.

General Lighting Approach

The days of using a lot of incandescent lamps in retail spaces are almost gone. For one, their amber cast shifts the colors of merchandise: Whites become yellow and reds shift to orange. People's skin looks pale. And when incandescents are dimmed, they become even more yellow. These color values just aren't acceptable in a clothing store.

Second, incandescents are very inefficient. You get the least amount of light for the wattage consumed and the highest amount of heat; this increases costs. With California's Title 24 (energy code) requirements, we are strictly limited to the watts per square foot allowed (often as little as 2.0).

Third, an incandescent lamp has a relatively short life. A typical 40-watt household bulb (an A lamp) lasts 750 hours, while a 40-watt fluorescent lamp is rated for 22,000 hours, and gives 3.5 times the amount of illumination for the same wattage.

But many clients wince at the thought of fluorescents because they are often used poorly in retail spaces (and many other places for that matter). What comes to mind is a sea of surface mounted or recessed fluorescents fitted with prismatic lenses. These become a source of glare, drawing attention to themselves and away from the merchandise.

But fluorescents can be effective if you use indirect lighting methods like mounting the fixtures on top of display units and behind soffits and fascias. This type of indirect lighting can make a store feel spacious and inviting, while softening the shadows that make people look unappealing (see Figure 2).

This works well in restaurants, too. How many times have you walked into an elegant place where each table is illuminated by a spot light? The look is dramatic, but the moment you sit down and lean into the light, you become a diner in a restaurant of the living dead. The hard light illuminates your nose, while your eye sockets recede into blackness. It's like holding a flash light under your chin, only in reverse.

With all this in mind, most of the light in this project is provided by strip fluorescents. Some task and accent lighting also comes from a low-voltage track system, and individual fixtures.

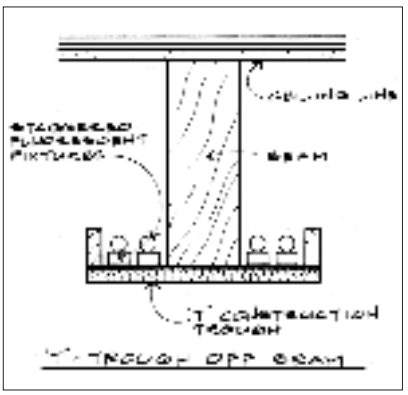

Figure 3. *These "T'' troughs added to the existing 24-inch ceiling beams are a simple, inexpensive way of concealing fluorescent strips. To eliminate ``hot spots,'' the fixtures were overlapped along the length of the beams.*

The Details

I was able to take most of the fluorescent fixtures I needed for ambient light and conceal them near the ceiling by using a soffit, the fascia boards of display units, and three 24-inch beams that were already in place. To make the beam-mounted fixtures disappear, I designed a simple T-shaped trough (see Figure 3). This way I was able to use off-the-shelf, 4-foot fluorescent strip fixtures. I overlapped them to prevent hot spots. The lamps are an energy-saving, deluxe, warm-white type (3,000∞Kelvin) that keep colors looking realistic without making skin look too ghastly (see ``Shedding Some New Light,'' previous page for more on this compromise).

I used wall sconces to light the dressing rooms and to fill in light in several other areas. The triangle of storage space behind the main display units uses the backlighting of these units for its task lighting.

Rather than use track lighting we fitted the shelving and hanging units with fluorescent fixtures so that the merchandise would never be in shadow because the customer got between it and the light source. Also, I used fluorescents at the top of the tall displays to provide more fill light for the store and to light in front of the ziggurat design.

The display windows and the "floating" display cubes are lit with a low-voltage track system. The color of the fixtures, their compact size, and their louvered fronts let them visually disappear into the ceiling. Because this source of light for the clothing displays and mannequins isn't obvious, it is much more dramatic.

I used lots of switched floor plugs - on the sales floor around the movable cubes and along the window display platform - so that portable fixtures could be used almost anywhere.

The lighting at the mirror was extremely important. Vertically mounted fixtures light the customers evenly from head to toe so that they - and the clothes they're trying on - look their best.

On Time

The job was completed in the 60 days allotted. So often project deadlines are missed -- fatal in commercial work -- because of back-ordered materials and unrealistic work schedules. On this job we made sure that suppliers could deliver (this forced us to switch brands in the track system), and Reed's skill in coordinating subs and materials took care of the rest.

Although it doesn't always happen this way on small commercial jobs, it was gratifying to hear the store has been doing a ``land office business'' since the day it opened. ■

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