



PR FOR PLANET EARTH™

A REPORT TO ADVOCATE FOR SOCIALLY  
RESPONSIBLE SUSTAINABLE DEVELOPMENT

## HUMAN-CENTRIC LIGHTING ADDS REFINEMENT TO GOODWILL OFFICE SPACE

ENEREF INSTITUTE EXAMINES HOW A THRIFT SHOP EMPLOYED  
COLOR-SHIFTED DAYLIGHTING TO ENHANCE THEIR OFFICE.

Goodwill, the nonprofit organization known for repurposing used clothing into assets for their mission to employ people with barriers to full-time work, has double-downed on their sustainability efforts in one building in Hampton Roads, VA.

With a focus on sustainability, Goodwill converted an abandoned Target into a Goodwill support center with three retail stores and a Community Employment Center. In doing so, the organization added yet another means of reaching its ultimate

# I THINK THE LIGHTING IS PROBABLY MAKING THAT SPACE WHAT IT IS. I REALLY MEAN THAT...

DANIELLE CRONIN | *Goodwill Community Relations*

goal: lifting up people and strengthening communities by repurposing that which society too quickly abandons.

Most notable for its design and sustainability is a new skylight technology in the open office area of the Hampton facility.

Ed Mack, Senior Manager of Real Estate & Construction for Goodwill Virginia, is a proponent of sustainable building practices throughout the Goodwill stores he builds—especially natural interior daylight.

“We’ve gotten to the point where the executive team is 100% on board because they see how skylights enhance our work environments,” explained Mack. “Natural light just has a better feel to it.”

In fact, sustainability is a meaningful aspect of Goodwill’s operations; the organization is a self-sustaining social enterprise that generates most of its revenue through retail stores while creating much-needed employment opportunities for its clients.

## MORE DAYLIGHT FROM ADVANCED TUBULAR DAYLIGHTING SYSTEM

To provide daylight for office staff, Goodwill was an early adopter of a new tubular daylighting system, LightFlex™ CCT. Tubular daylighting systems bring natural light into suspended-ceiling applications, such as offices, schools, healthcare facilities and retail environments that wouldn’t otherwise have direct access to a roof.

“In a retrofit project, tubular devices just make sense. They work, and they get you natural light,” explained Bruce Perretz, Architect and President of Perretz & Young. “That was why I chose them for Goodwill. There was so much space above their drop ceiling, tubular was the best decision.”

This tubular daylighting system from Sunoptics Prismatic Skylights is a more advanced skylight system that converts the cool-white color of sunlight into warm 3700K, the common color temperature of indoor electric lighting. It is designed to minimize the color dissimilarity that ordinarily exists between electric lighting and natural daylight when they are near each other in the ceiling. It can also be used where warmer-color daylight is simply preferred.

Increasingly, we are discovering how the color of white light—from cool white to warm white—impacts our natural metabolism, as well as our daily biological circadian rhythm. The sun regulates our 24-hour cycle, and our daytime alertness patterns are also mediated by light exposure to our eyes. This may be why research shows that people perform better in properly day-lit facilities.

Equally important to visual comfort in an interior space is the quality of light distribution, as Goodwill’s Ed Mack noted in describing the conference room where the tubular daylighting

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**AS PART OF OUR NATURAL INTERIOR DAY LIGHT INITIATIVE,** *Eneref Institute interviewed participants in the planning and implementation. Interviewees included Ed Mack, Senior Manager of Real Estate & Construction for Goodwill Virginia; Bruce Perretz, President of Perretz & Young; Justin Holbrook, Project Manager of Henderson Incorporated; Pete Shannin, Acuity Brands Vice President, Daylighting Product Solutions; Danielle Cronin, Mission Advancement Manager for Goodwill of Central and Coastal Virginia.*



## TUBULAR DAYLIGHTING SYSTEM

*The CCT system minimizes the color dissimilarity between electric lighting and natural daylight.*

system employed Sunoptics prismatic skylights.

“It’s a very even light during bright daylight,” said Mack. There are no hot spots. There’s no glare.”

The energy savings from skylights is notable. Ed Mack observed that on a typical day, the electric lights are turned off by the control system for most of the day, thereby creating, he estimated, a 75% savings in lighting energy costs. The electric lights switch off automatically whenever the daylight from skylights provides sufficient illumination.

### EASILY RETROFITTED INTO EXISTING ROOFING

Tubular daylight devices (TDDs),

also referred to as tubular skylights or light pipes, are constructed of three components: a dome (skylight), a tube made of reflective material and a diffuser. Sunlight is captured through the dome on the roof and is transported through the tube and diffuser into the interior space. They differ from traditional skylights in that the tube allows for slight bends around pipe or sprinkler lines. More importantly, they allow daylight from the skylight to reach through dropped ceilings into interior spaces that have no direct access to daylight.

In the Goodwill facility, tubular daylighting systems were retrofitted long after the building

was constructed. Goodwill’s Ed Mack reported that the installation of the TDD did not adversely impact the integrity of the roofing system.

“When a hurricane comes up here along the East Coast, we can get a ton of rain,” said Mack. “I haven’t had any issues with the skylights.”

### BOOSTING PERFORMANCE, SAVING ENERGY

Skylights provide human-centric benefits, which is why they are often found in high-performance sustainable building design. For Goodwill, however, the value of skylights includes energy savings as well as the benefits that natural interior daylight offers their store customers and employees. Retail

companies often see an increase in sales in stores with skylights, and office managers report lower absenteeism in workplaces. When human performance results are included, the return on investment is significant.

As Architect Bruce Perretz said, “Goodwill is building with skylights because they see the payback.”

The energy saved by skylights is a meaningful bonus to the human-centric benefits of daylighting, because electric lights are often unnecessary during daytime hours. In fact, during one thunderstorm this year, the entire 118,000-square-foot Goodwill building lost power. Retail shoppers were forced to leave because there was no electric lighting in the store. However, because the skylights were providing enough light to the office area, the employees didn’t even realize that the power had gone out.

“People were walking by the office and saying, ‘Wait, how do you guys still have power when the rest of the building doesn’t?’” said Goodwill’s Ed Mack.

### HOW LIGHTFLEX CCT TUBULAR DAYLIGHTING SYSTEM WORKS

What makes the skylights installed in Goodwill’s open office space innovative is a panel-size phosphor lens inside the tube, which changes the color of sunlight—from warm white to

cool white—as it passes through. The phosphor color-shifts the color temperature of sunlight to 3700K, allowing the skylights to match the color temperature of the LED electric light fixtures.

“We designed LightFlex CCT to better align daylighting with lighting design best practices,” explained Pete Shannin, Acuity Brands® Vice

President, Daylighting Product Solutions. “No one designs general illumination around cool-white 5000K; why should they compromise when they use daylight?”

Each of these systems has a high-performance Sunoptics prismatic skylight on the roof and prismatic optic sphere below it that maximizes sunlight by



## THE SciBox:

# PHOSPHORS AND CCT

### *How the phosphor panel lens transforms cool blue colors into warm red colors.*

WHEN THE PHOSPHOR ABSORBS A PHOTON OF ELECTROMAGNETIC RADIATION in the visible spectrum of, say, 550nm (or about 5500K), it emits a longer wavelength of about 600nm, extending the light toward the warm, red end of the visible spectrum. Phosphor has the property of luminescence. Therefore, the emission of warm light by the phosphor is caused by the absorption of blue daylight by the phosphor.

The correlated color temperature (CCT) is a color “appearance” of light emitted by a light source. A CCT rating of around 2700K is considered warm color light. Natural white is around 4000K and cool white light is above 5000K.

## THE CONTROL SYSTEM

*The controls can incrementally adjust the color from 3000K to 5000K.*



driving the light deep into the light-well—especially important when the sun enters from a low angle early or late in the day. Controllable louvers in the skylight adjust the amount of daylight allowed into the conference room. Despite the distance between the roof and the conference room ceiling, very little light is lost as it bounces down the light-well because the highly specular MIRO-SILVER® material channels almost all of the light into the building.

### TUNABLE LEDS COMPLEMENT NATURAL DAYLIGHTING

In conjunction with the tubular skylights, Goodwill installed BLT LED electric light fixtures. The

LEDs can be “tuned” from warm white light to cool white light. This allows occupants to optimize the light to match their task.

To control both the (tunable) color and the (dimnable) intensity of the LEDs, Goodwill employed an nLight® nPODm controller—a kind of advanced light switch. The nPODm can incrementally adjust the color of the LED light in the conference room from a warm 3000K to a cool 5000K.

### A BETTER FEEL WITH BETTER RESULTS

Ed Mack is responsible for identifying and building new Goodwill locations throughout the organization’s 39 cities

and counties. In upgrading the Hampton support center with skylights, his primary goal was to offer its staff the same appealing workspace characteristics as those of the Richmond, VA, office. But unlike Richmond, the Hampton office had no windows.

“We were very mindful of our staff when we developed the plans for the new space. We wanted the Hampton office to have a similar look and feel to that of our Richmond-based support center,” explained Mack. “So the solution was, ‘Hey, I have to put skylights in there.’”

Architect Bruce Perretz specified tubular skylights because they best accommodated the space.





#### TUBULAR DAYLIGHTING DEVICE

*“In a retrofit project, tubular devices just make sense,” explained Architect Perretz.*

“We had a 15-foot drop ceiling. It’s a big space, and too many systems were in the way—a lot of hanging wires, duct work, lighting fixtures, sprinkler systems,” he explained. “There was just no way to channel daylight that distance with a skylight, so we put in tubes.”

Perretz concluded, “We’ve reduced the number of lights and the number of hours the lights are being used. So, it’s worth it. And to me, I’d rather have natural light in the space. I would lean my clients towards doing it and making the effort.”

#### NATURAL LIGHT ENHANCES SPACE, SETS MOOD FOR EMPLOYEES

As the Mission Advancement Manager for Goodwill of Central and Coastal Virginia, Danielle Cronin gives community tours of the new office space. She said that when she brings visitors into the open office space, “They often remark at how beautiful the workspace is.”

“I think the lighting is probably making that space what it is. The light accentuates the furniture and sets the mood so you feel more awake,” said Cronin. “I really mean that...”

Cronin’s comments validate research demonstrating that absenteeism is reduced in

workplaces with properly installed skylights. While Cronin can work from several Goodwill locations, she prefers the one in Hampton.

“I enjoy that work environment so much that I make a 45-minute commute just to go and work in that space. That’s a testimonial for the skylights.”

Goodwill’s Ed Mack concurred, “It’s true—they’ve made a huge difference in that space. The skylights create such an appealing environment that we know they’ll have a positive long-term impact on our associates and overall mission.”



## **PR FOR PLANET EARTH™**

*Every organization must harness their capacity  
to improve our planet and society.*

Right now, we need to make unprecedented changes to ensure a sustainable and equitable society. Limiting global warming requires rapid and far-reaching transitions in land, energy, industry, buildings, transport and cities. Every extra bit of warming matters to reduce irreversible harm to our ecosystems. We encourage organizations to grow sustainably and act responsibly by raising awareness for clear, specific solutions that offer an efficient use of natural resources, demonstrate social responsibility and foster a peaceful, earth-friendly economy.

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