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The magazine of the Illuminating Engineering Society of North America

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A Tree Glows in Calgary

Massive tree-shaped sculptures take on color-changing hues, but stay true to their roots

BY SAMANTHA SCHWIRCK

On any given day, Calgary's Stephen Avenue Walk—an outdoor pedestrian mall known for its mix of upscale boutiques, restaurants, office complexes and historic architecture—attracts up to 10,000 visitors per hour. Back in 2000, 10 massive, tree-shaped steel sculptures were installed on the corridor to create a better visitor experience for those strolling down the walkway. The sculptures soar as high as 85 ft above the avenue and immerse pedestrians in a display of large-scale public art. Two years following the installation, Stephen Avenue Walk was declared a national historic site, encouraging even more foot traffic.

To stay grounded, the sculptures' bases are anchored to concrete caisson caps that extend 64 ft below the ground. The depth of the caps allows the trees to resist uplift forces as heavy as 180,000 pounds. Needless to say, the sheer size of the trees is an impressive sight. But despite their imposing presence, Kimberly Mercier, principal at Lighting Design Innovations, Calgary, says that the sculptures—and, consequently, the corridor—felt dark.

During the day, the gloomy vibe was due in part to the walkway's positioning between rows of tall, corporate towers, but also exacerbated by some of the sculptures' original design elements. "The structures had been maintained for a number of years," Mercier explains, "and the selected paint color—a deep forest green—was not ideal for creating a feeling of lightness in a city corridor with high-rise towers lining the street."

By night, the sculptures were previously illuminated by a combination of metal halide, incandescent and fluorescent floodlights that were mounted directly on the trees, but the system had stopped functioning entirely due to exposure. Even when the components did work, the design was not effective, Mercier says. "The mounting and aiming arrangements of the luminaires never ensured luminance, and the lighting of the sculptures could not be seen by observers."

Photos: Michael Heywood

The trees' bases, grounded by concrete caisson caps that extend 64 ft below the ground, are highlighted by color-changing LED spotlights.

INSPIRATION ON DEADLINE

In 2013, LDI collaborated with the City of Calgary and the Calgary Downtown Association to develop a new illumination plan for the site. The construction schedule proved challenging from the start because the space is city-owned and regularly utilized. For one, Mercier explains, "It has considerable sidewalk patio dining that cannot be impeded because of restaurant leasing contracts with the city." In addition, contractors had to work around seasonal events such as the Calgary Stampede, which brings more than one million visitors to the corridor every summer. "During the construction year, the budget approval was required in time to bid/tender, award, sign contracts, order materials and mobilize to complete construction in three months of contractor working time," Mercier says.

Though timing was constrained, Mercier's inspiration was not. Since the original installation merged nature and urbanism—the tree shape conveys an organic vibe, while the materials are man-made and set within a city—the new lighting would follow suit. After considering logistics, aesthetics and the installation's backstory, the goal became to add brightness and improve views, while keeping the original artistic intent intact. "Views from adjacent buildings include a view from the Devonian Gardens—an indoor city park," Mercier continues. "The desire was to translate the 'literal nature' in the gardens to the 'industrial nature' conveyed by the steel tree sculptures."

During the design process, one major consideration was the viewpoint and speed of pedestrians, as well as those traveling by car since the area is open to vehicles between 6 p.m. and 6 a.m.—or, as Mercier notes, "exactly when the lighting is showcased." The design team also considered the various retail spaces within the corridor to ensure that illumination would not interfere with store façades.

Before implementing the new scheme, existing non-functional luminaires were disconnected, de-lamped and removed from the trees. In some areas, painting over existing fixtures was the only option. "For some of the luminaires, removal would have been more obvious due to the voids left by the old mounting methods," Mercier explains. Additionally, the tree trunks were painted white to brighten the structures' daytime appearance and create a blank canvas for nighttime illumination.

CUSTOMIZED FLEXIBILITY

The new solution—which won an IES Illumination Award of Merit in 2014 as well as a Vitality Award from the City of Calgary—involved three major components: color-changing LEDs, ceramic metal halide gobos and a DMX control system. Low-profile LED tape lights (Green Image Tech) were attached to the trees' "leaves" to outline and illuminate tree canopies. To downlight the trunks, high-output LED spotlights (Philips) were mounted directly onto the structures right above their midpoints. Similarly, 100-W LED PAR luminaires (Altman)—fixed onto existing shelf-like platforms on the trunks' lower halves—were used to provide spill light for the "leaves" (**Figure 1**). All three of the LED sources are color-changing. Lastly, CMH gobos were secured onto the structures in locations that previously housed junction boxes. The gobos project a mottled-light pattern of repeating, stylized leaves onto the roadway and sidewalks, which Mercier says "gives the impression of a 'forest carpet.' "

The city conducted both motorist and pedestrian studies to evaluate how the new system would fare in the setting before approving the final installation. "The gobos were aimed to ensure pedestrians and people in the adjacent towers could view the leaf-carpet effect," Mercier says. "But the effect cannot be seen by motorists, so there is no impact on roadway markings for the motorists navigating the block."

Photo: Mike Buck Photography

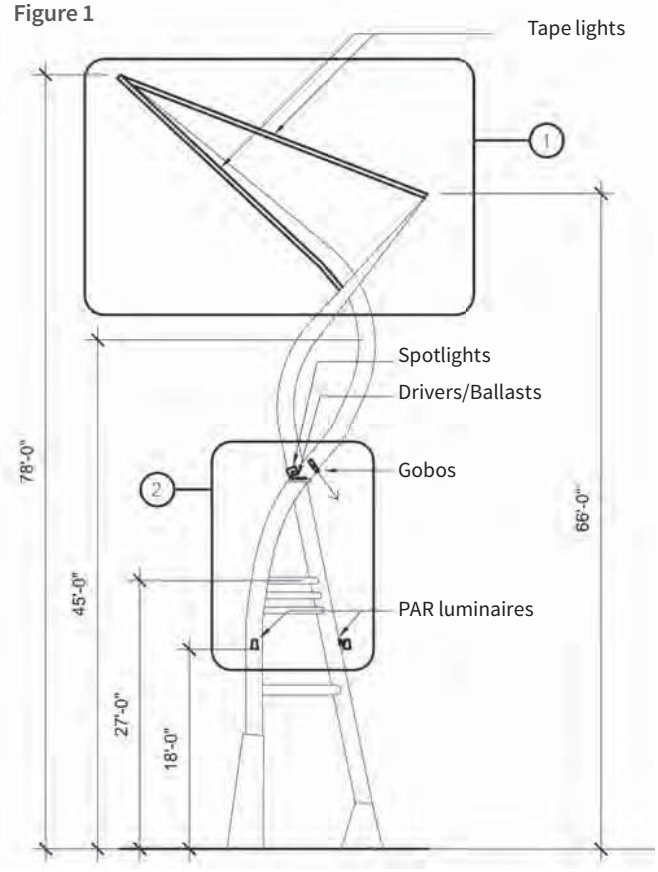
Changing Places

Just as it's possible to place elements inspired by nature into man-made settings, it's also possible to place man-made elements into natural settings. The Bissell Tree House at John Ball Zoo in Grand Rapids, MI, provides a good example. The tree house, which can be rented out for various events, is meant to be a vessel through which guests can celebrate the surrounding lush forest. Though the building is enclosed, large glass windows immerse visitors in nature.

Lighting designers from Progressive AE, Grand Rapids, MI, used linear fluorescent lights and xenon pendant luminaires to enhance daylight from the windows without detracting from the overall experience. The pendants are suspended at various levels to mimic natural phenomena such as scattered stars or falling rain. Finally, multi-zone controls with dimming provide flexibility and enhance ambience—one final way to maintain the outdoor vibe, from within.

Samantha Schwirck

Figure 1



Low-profile LED tape light outlines and illuminates tree canopies in conjunction with scenes controlled by a DMX system that is operated by the City of Calgary.

In addition, a DMX system is programmed with 10 preset scenes for holidays and festivals. Thanks to training sessions, the Calgary Downtown Association can operate and program the lights, and create new scenes as needed. Controls and programming feature an astronomical ON/OFF function and are web-based, which provides flexibility for the association. "Wireless and Internet access to the system is available on the block—literally, standing on the sidewalk—or even from home," Mercier says. Lighting controls are also integrated with the area's music broadcast system. "These are things that are frequently accomplished in theaters or museums, but more rarely taken outside."

The total construction cost for the new lighting system was less than one-half that of the original system, and the new solution consumes less than one-quarter the energy. "The original installation consisted of custom luminaires, many luminaires and many source types," Mercier explains. "The new installation utilized commercially available luminaires and design details that simplified contractor efforts, resulting in significant construction savings." Energy saved is due to the use of LEDs, as well as low-wattage narrow-beam CMH lamps. Finally, the new lighting stays true to the sculptures' origins. "The lighting makes the true extent of the installation more understood to visitors and conjoins the installation in a way that was previously unrealized." ☐

FAST FACTS

- Stephen Avenue Walk sees up to 10,000 pedestrians per hour.
- Steel tree sculptures soar at 75 ft and 85 ft above the corridor.
- Color-changing LEDs and CMH gobo projectors add vitality to the once-dark walkway.

THE DESIGNER

Kimberly Mercier, PE, P.Eng., LEED AP, Member IES (1994), past-president IES, is principal at Lighting Design Innovations, with offices in Batavia, NY, and Calgary.