

landscapeforms®

# LED Lighting



LED Pedestrian and Pathway Lights

# Contents

## DESIGN

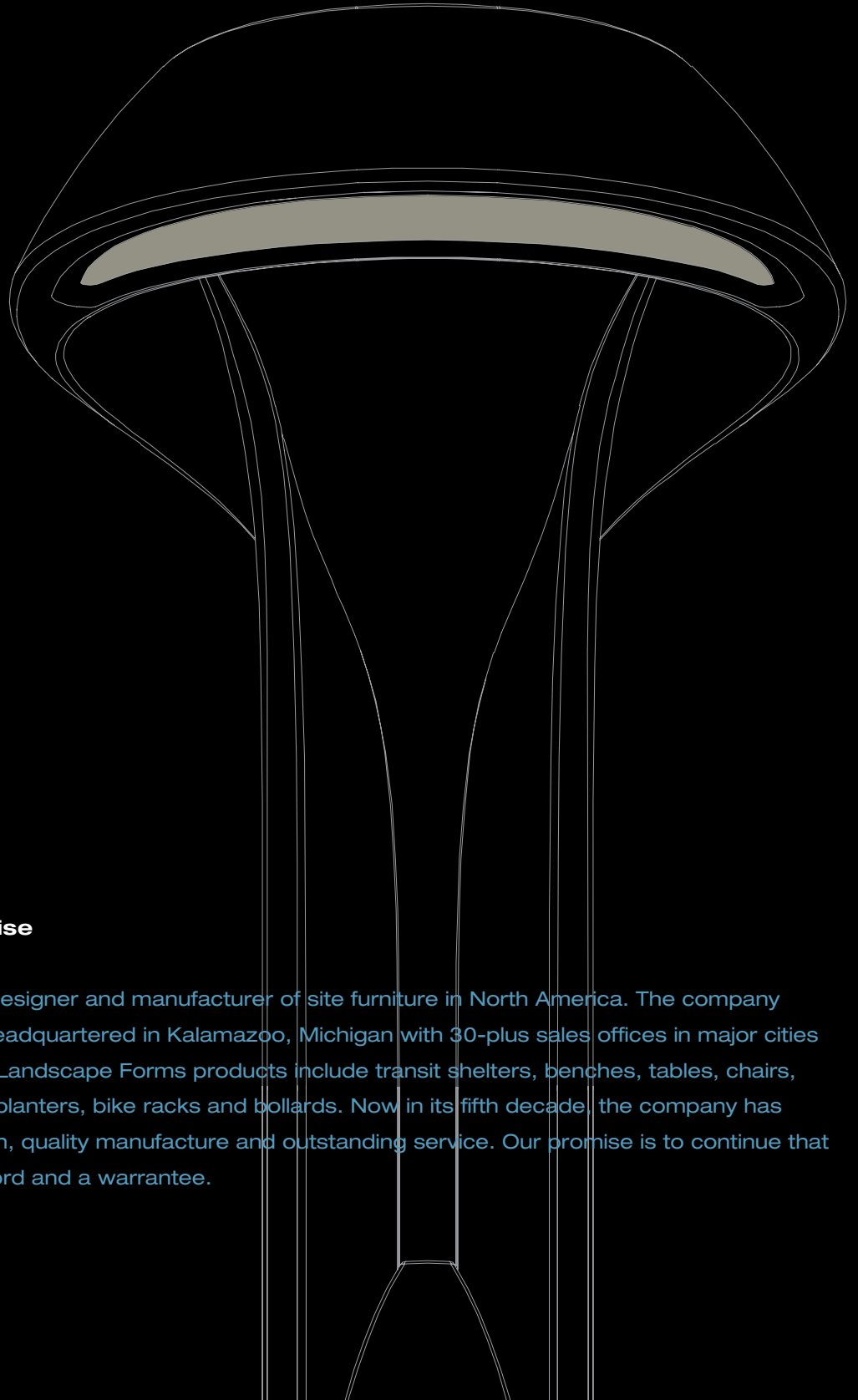
The Power of Design.....1  
The Visual Experience.....2  
Glare .....3

## TECHNOLOGY

LED .....4  
LED Luminaire Design .....5

## ECOLOGY

Energy.....6  
Light Pollution .....7  
Color .....8  
Sustainability.....9



## The Landscape Forms Promise

Landscape Forms is the leading designer and manufacturer of site furniture in North America. The company manufactures in the U.S. and is headquartered in Kalamazoo, Michigan with 30-plus sales offices in major cities worldwide. In addition to lighting, Landscape Forms products include transit shelters, benches, tables, chairs, umbrellas, litter/ash receptacles, planters, bike racks and bollards. Now in its fifth decade, the company has earned a reputation for fine design, quality manufacture and outstanding service. Our promise is to continue that legacy and we back it with our word and a warrantee.

# The Power of Design

Landscape Forms believes in the power of design to make outdoor spaces more welcoming, usable, attractive and safe. For more than 40 years the company has enjoyed a reputation for design leadership and today, Landscape Forms' identity is synonymous with design among corporate and institutional clients and world-class design professionals alike. Award-winning Landscape Forms products are installed in parks, universities, hospitals, municipalities and other great public spaces. Major clients include American Airlines, Cisco Systems, Disney, Mayo Clinic, Microsoft, Nike, Sprint, and Toyota.



## The Role of Lighting Design

Sparkle and shimmer are only part of the story.  
Good lighting design also addresses:

**Safety**

**Standards**

**Environmental Impact**

**Maintenance**

**Economics**

Landscape Forms LED lighting, developed in collaboration with environmental lighting consultants Nancy Clanton & Associates, addresses all the dimensions of lighting design and expands our mission to enhance outdoor spaces.

*"We use a warm light that's better for human health, distribute it in ways that eliminate glare, and use every bit of light we produce, so there's no wasted light going up into the night sky. Landscape Forms looked at this with fresh eyes. Nobody else is doing this."*

Nancy Clanton, Clanton & Associates

# The Visual Experience

An improved visual experience does not necessarily need more light. The goal of outdoor lighting should not be to turn night into day. Night has its functions, nature its mandates. At Landscape Forms we believe that outdoor lighting should mimic elements naturally present at night. We take a fresh perspective on outdoor lighting, using natural moonlight as the inspiration for a better solution.

Landscape Forms applies current learning about the natural human interaction with color, contrast, and glare to enhance the visual experience while protecting the environment. This improvement in visual awareness is paramount to providing a greater sense of security.



*"Extreme uniformity minimizes object detection because everything is at the same lighting level. With effective uniformity, a little variance in brightness helps detection. It's all about creating some contrast by using less light and directing it better. People who know quality lighting understand this concept and Landscape Forms is in the top league."*

Nancy Clanton, Clanton & Associates

# Glare



The organic configuration of individual lamp arrays in Landscape Forms LED lights deliver a more pleasing, glare-free light than the typical linear configurations of competitors' LED lights or the intense wattage of HIDs.

## Reduced Glare = Enhanced Visibility and Safety

Glare is commonly divided into three categories describing the level of intensity: nuisance, discomfort, and disability. Glare in any category reduces our ability to perceive colors and contrast. Conversely, the absence of glare will prevent unwanted adaptation of the eye and significantly improve the visual experience.

Landscape Forms LED lighting provides multiple aiming angles and puts light only where it is needed to avoid "glare-bombs" in all categories.



# LED

## The Dawn of a New Era

Lighting technology hasn't changed much in the past 100 years but advances in LED efficacy, longevity, and desirable white light color have made LED lighting a viable solution for outdoor environments. The unwanted side effects of traditional lighting: wasted energy, high maintenance costs, and the negative visual and environmental impacts of over-illumination, are driving the adoption of LED's as an alternative to HID lamp sources.

Lighting designers and engineers recognize LED potential. The U.S. Department of Energy states:

*"...Solid-state lighting (which includes LED) has the potential to more than double the efficiency of lighting systems, significantly reduce our carbon footprint and transform the built environment..."*

### The Major Benefits of LED Lighting

- Energy Efficiency
- 
- Long Life/Slow Failure
- 
- Sustainable Non-toxic Materials
- 
- Durability against Vibration and On/Off Cycling
- 
- Light Pollution Control



# LED Luminaire Design

## Ease of Maintenance with Replacement LED Cartridge

Landscape Forms LED lights incorporate a quick-connect replaceable LED cartridge that protects the initial investment. Technology upgrades can be made as desired -- and the lights are very easy to maintain.

## Thermal Management through Integrated Design

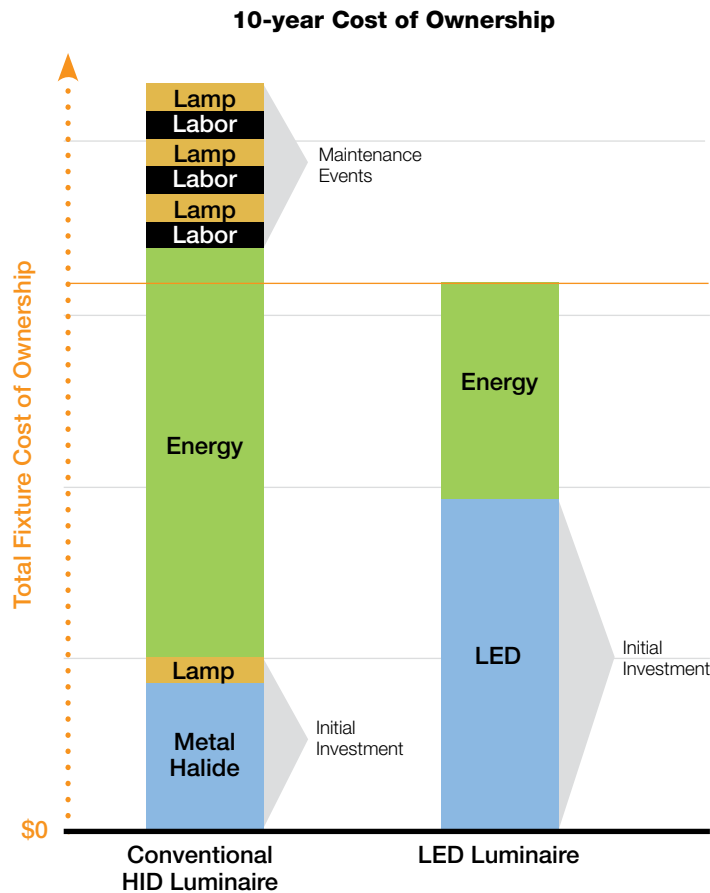
LED light sources can be exceptionally long-lived -- up to 20 years under optimal conditions. However, LED's generate heat differently than traditional lamps. LED lights must be specifically designed and engineered to manage thermal build-up in order to prevent it from dramatically reducing light output and longevity. Retrofit designs and generic engineering solutions will not achieve optimal performance. Landscape Forms employs integrated design of LED light arrays and luminaires to provide superior thermal management.



LED Cartridge

# Energy

The Department of Energy, states and counties across the US are adapting energy directives and ordinances that set energy efficiency goals and guidelines. LED lights help achieve these goals by providing exceptional efficiencies through reduced energy consumption and light pollution control. That's why Landscape Forms focuses on LED solutions in its lighting for outdoor environments.



LEDs produce on average six times as many lumens per watt than incandescent bulbs. They control light pollution, delivering significant energy benefits. Light pollution is wasted light – and that means wasted energy. The highly directional light provided by LEDs makes efficient use of all light generated by putting the light just where it is needed, with no light waste. And LEDs are non-toxic, so they provide these benefits without endangering the environment. LED lighting for outdoor spaces is a sustainable solution that's good for the environment and good for the economy.

Landscape Forms is an ENERGY STAR Partner. ENERGY STAR is a joint program of the US Environmental Protection Agency (EPA) and the US Department of Energy (DOE) in which public and private sector businesses commit to manufacture products to meet ENERGY STAR specifications and sell ENERGY STAR labeled products that provide environmentally friendly choices to consumers.



# Light Pollution

*"Light Pollution is an increasing problem threatening astronomical facilities, ecologically sensitive habitats, all wildlife, our energy use as well as our human heritage. Light pollution is excessive and inappropriate artificial light."*

IDA citation

## Dark Skies Protection

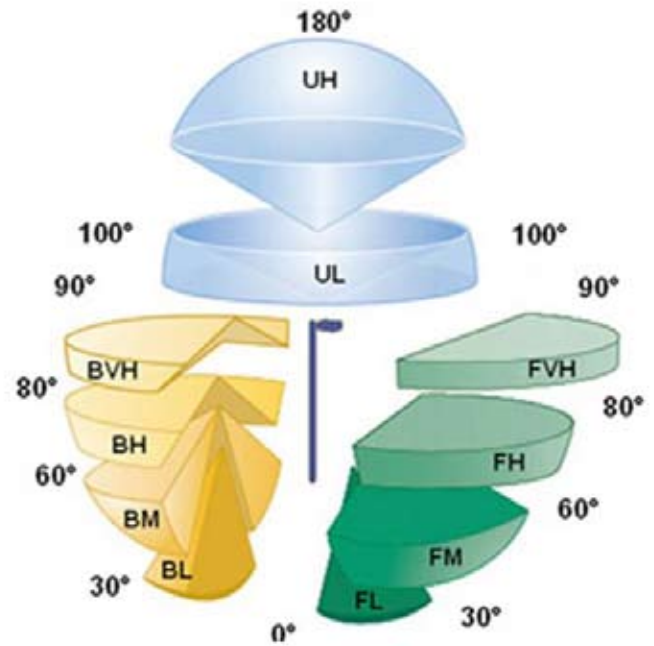
Many outdoor spaces are over illuminated, with negative consequences for energy consumption, carbon emissions, human wellbeing and light pollution. While most people correctly associate light pollution as the brightening of the night sky, it may also be the presence of excessive or inappropriate light where it is not intended or needed. Landscape Forms lighting is designed and engineered to provide dark skies protection by delivering the appropriate light levels required for function and safety.

## MLO and LEED

The Illuminating Engineering Society (IES) and International Dark Sky Association (IDA) have combined resources to develop the Model Lighting Ordinance (MLO), a single generic outdoor lighting guide written for easy adoption into community codes and bylaws. The MLO is consistent with the California Title 24 outdoor lighting energy code, and its lighting zones are the basis for the US Green Building Council's (USGBC) LEED system for Sustainable Sites Light Pollution Reduction Credit 8. Landscape Forms LED lighting meets MLO requirements.

## BUG

Just as the A&D community started to adopt sustainable lighting terminology known as Cutoff and Full Cutoff, the terms quietly became obsolete. In 2009, previous cutoff classifications were replaced with the newer and more comprehensive rating system known as BUG. The BUG (Backlight, Uplight, Glare) Rating System, a three-year effort by the IES and IDA, addresses potential light pollution from all directions, not just up into the night sky. The BUG Rating system is so comprehensive it has become the foundation for the lighting zones outlined in the MLO and used by LEED. Landscape Forms provides BUG ratings for its lighting products.



**Uplight**  
which causes artificial sky glow.

**Glare**  
which can be annoying or visually disabling.

**Backlight**  
which creates light trespass onto adjacent sites.

# Color

## Color Matters

While other lighting manufacturers often use cool-white color (6,000° Kelvin) for their lamp sources, Landscape Forms uses a 3,700° Kelvin warm-white color that mimics nature and provides illumination similar to moonlight. Color in this range supports the natural Circadian rhythm and melatonin/serotonin cycle that is essential for human health. The cool-white color used by others is almost blue in appearance and has been implicated in species extinction and human health problems.

## Color Rendering

Lamp color is important for many ecological reasons, but the ability of a lamp to render colors should not be overlooked as an important facet of exterior illumination. Lamps with poor color rendering (such as sodium lamps) require more energy to achieve similar visual effectiveness. Lamps with excellent color rendering will need less energy and actually improve the visual experience by increasing contrast and improving object detection. Landscape Forms' use of naturally occurring warm-white light employs excellent color rendering.

## Turtle Safe

In addition to warm-white light, Landscape Forms offers amber-colored light (580 nanometers or greater) for use in coastal areas to protect sea turtle migrations and habitat.



# Sustainability

Landscape Forms lighting is:

**Lead and Mercury free.**

**RoHS compliant**

**Recyclable.**

Landscape Forms makes stewardship of the environment a vital part of our business. All steel, aluminum, wood scrap and sawdust generated in our manufacturing processes are recycled. 99% of the water used in our manufacturing processes is recycled. The majority of our steel and extruded aluminum comes from mills and plants within 150 miles of our facility, reducing environmental impacts resulting from transportation. We are in full compliance with all current environmental laws and retain a consultant to ensure continued compliance. As a result of re-engineering our processes, our impact on air and water is so minimal that the DEQ no longer requires air or water permitting at our facility. Our manufacturing facility has a CA rating.

Landscape Forms products embody timeless design and sophisticated engineering that give them long years of useful life. Our metal products are finished with durable, weather-resistant Pangard II HAPS, VOC, lead free polyester Powdercoat.

Landscape Forms is a member of LEED, an initiative of the USGBC (US Green Building Council.)

# Warranty

Landscape Forms, Inc. warrants all products (other than noted exceptions) to be free from defects in material and/or workmanship for a period of three years from date of invoice.

This warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse. Landscape Forms, Inc. will, at its option, repair, replace, or refund the purchase price or any items found defective upon inspection by an authorized Landscape Forms, Inc. service representative.

## **Our Pledge**

Your complete satisfaction and future business are our goals. Standing behind our products has been a cornerstone of our commitment to quality and service since our founding in 1969. Our products will satisfactorily perform their intended function, under normal conditions, for many years. If you are ever dissatisfied with one of our products, please contact us and let us demonstrate our commitment.