

atelier ten

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BY EMAIL
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Life Time Fitness at High Ridge Park Lighting Improvements

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Atelier Ten Lighting Design of New Haven, CT was engaged by High Ridge Real Estate Owner, LLC and Life Time Fitness to evaluate the existing exterior site lighting conditions at High Ridge Park Corporate Center in comparison with the proposed new exterior lighting plans.

We found that the existing site lighting is in poor condition, inconsistently maintained, and the pole top luminaires produce objectionable glare. The current site lighting does not provide sufficient horizontal illumination or satisfactory uniformity for proper safety and security illumination.

In comparison, our evaluation of the new site lighting design proposed by Life Time Fitness indicates that this will be significant improvement for lighting quality and glare reduction for neighboring properties. The new system uses high-quality LED luminaires with superior photometric performance for enhancing color rendition, visual acuity, and uniformity while controlling light pollution and glare in keeping with Illuminating Engineering Society recommendations. This system enables variable output to ensure proper safety and security lighting during periods of high and low activity.

In addition, Life Time Fitness plans to further minimize illuminance for neighbors by implementing interior shades for night-time use as well as planting additional evergreen vegetation at the site perimeter to block glow from headlights.

For Atelier Ten USA LLC,



Mark Loeffler, IALD, LEED Fellow
Director

Existing Exterior Lighting Assessment

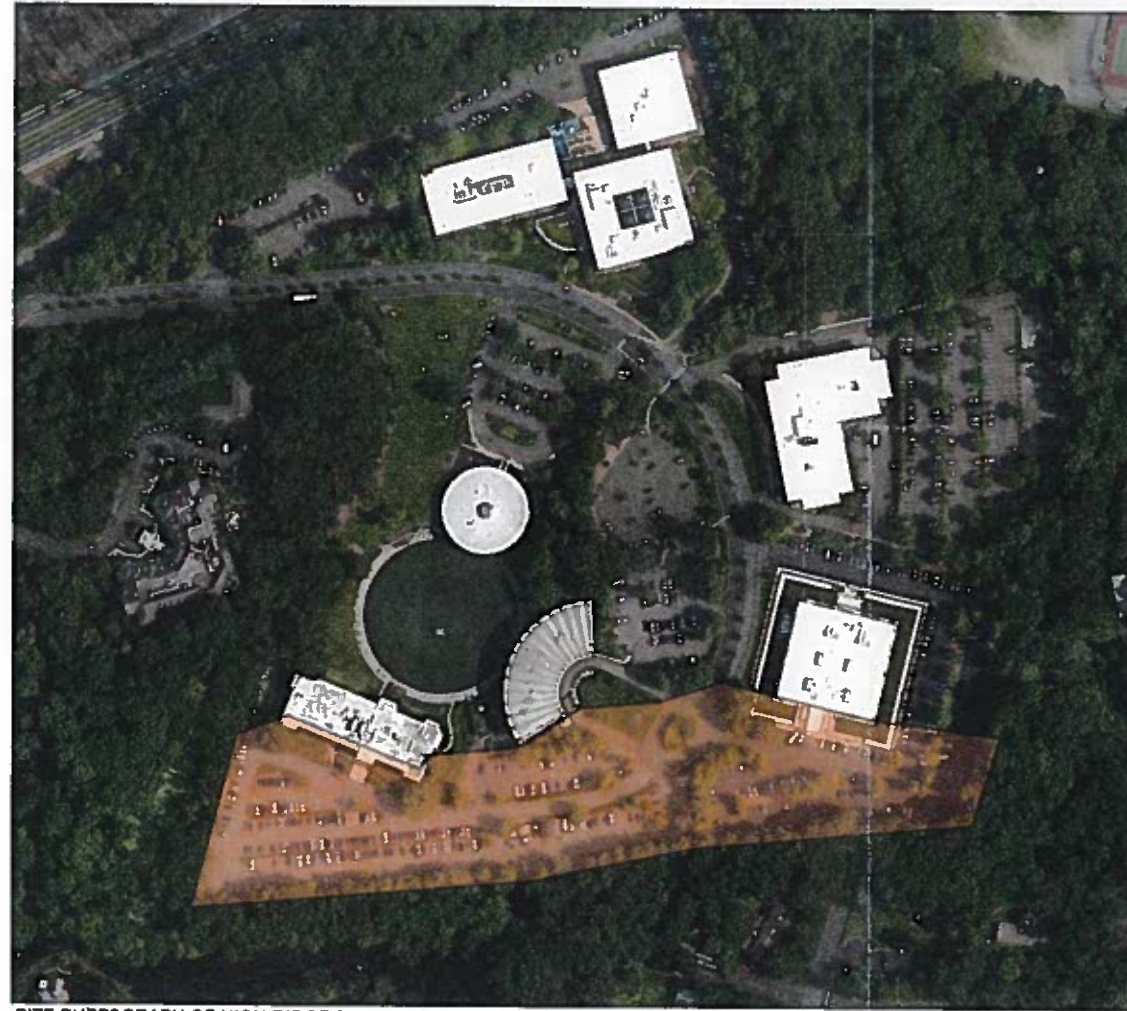
8728 Life Time Fitness at High Ridge Park, March 20, 2017

Summary

Atelier Ten was engaged by George Comfort & Sons and Life Time Fitness to evaluate the existing exterior and site lighting conditions at High Ridge Park Corporate Center and review the proposed new exterior lighting plans. The objectives of this are to compare the existing and proposed lighting quality, quantity, and illumination spilling onto neighboring properties (also known as light trespass).

We found that the existing site lighting meets Illuminating Engineering Society recommended practice for restricting light trespass, but that the pole-top luminaires are in poor condition, inconsistently maintained, and the diffusing lenses produce objectionable glare. The current site lighting does not provide sufficient horizontal illumination or satisfactory uniformity.

In comparison, the illuminance models for new site lighting design proposed by Life Time Fitness uses high-quality LED luminaires with superior photometric performance and glare shielding. The new system will be a significant improvement for lighting quality and glare prevention with no measurable horizontal illuminance beyond the property boundary.



SITE PHOTOGRAPH OF HIGH RIDGE PARK SHOWING SURVEYED AREA



POLE TOP LUMINAIRE WITH INDUCTION LAMP



POLE TOP LUMINAIRE WITH TWO HEADS



POLETOP LUMINAIRE SHOWN IN SITE CONTEXT

Existing Exterior Lighting Assessment

8728 Life Time Fitness at High Ridge Park, March 20, 2017

Existing System Evaluation

The High Ridge Park Corporate Center is a 40-acre corporate campus located in Stamford, Connecticut. The complex has six office buildings constructed from 1967 - 1975. The northern boundary of the site is adjacent to CT-15 Merritt Parkway, the east and south edges of the site are shared with residential development, and the western boundary is shared with Sunrise of Stamford, assisted living community. The southwest corner of the site is bounded by Sterling Lake. The interior perimeter of the site maintains a forested zone with a chain-link fence at the boundary. There is a varying distance of forested land between the site boundary and adjacent developments.

On the evening of 20 March 2017, Atelier Ten conducted a site visit to measure illuminance levels and document lighting characteristics. The current site lighting consists of pole-mounted luminaires, bollards, and building-mounted luminaires. The buildings are internally lit by varying levels of office lighting. At 8:00 pm there were a limited number of people in the buildings and some rooms were lit. It was unconfirmed whether the buildings are controlled by a timeclock. Ongoing construction within Building 3 has internal construction lighting that is noticeably brighter than the other buildings.

Horizontal and vertical illuminance measurements were taken with a Konica Minolta T-10 Illuminance Meter in the center of the driving lanes, inside parking spots, directly below lighting fixtures, and adjacent to the site boundary fence where accessible. Horizontal measurements were taken at ground level. Vertical measurements were taken at approximately 5'-0" above the ground plane. These existing system horizontal and vertical illuminance readings are documented on Page 3.

A large section of the southwest parking area in front of Building 3 had pole lights that were not illuminated as the building is not currently

occupied, so measurements were not taken in this area. However, study of the parking area proximate to Building 1 was conducted and this area has an analogous lighting condition and proximity to neighboring properties.

Atelier Ten noted that the existing lighting uses a variety of retrofit lamp (light bulb) types, including induction, metal halide, and LED sources of unknown wattages and lumen outputs in pole-top and roadway type luminaires. This results in inconsistent color quality and poor photometric performance. The pole-top luminaires have an acrylic protective lens which has become cloudy, therefore these are not providing proper site lighting and have become a significant source of visible glare.

The existing horizontal illumination measured in the parking areas ranges from a maximum of 3 footcandles to a minimum of 0.008 footcandles (fc). For the driving lane illumination, readings range from 1.09 fc to 0.03 fc resulting in a poor uniformity ratio of 36:1. The horizontal illuminance measured at the site boundary was below 0.05 fc, generally considered acceptable. The Illuminating Engineering Society recommendation for this application is a uniformity ratio no higher than 10:1 with an average of 0.6 footcandles with less than 0.1 fc at the site boundary. The proposed new lighting system will rectify this uniformity problem while eliminating horizontal illuminance well inside the property boundary.

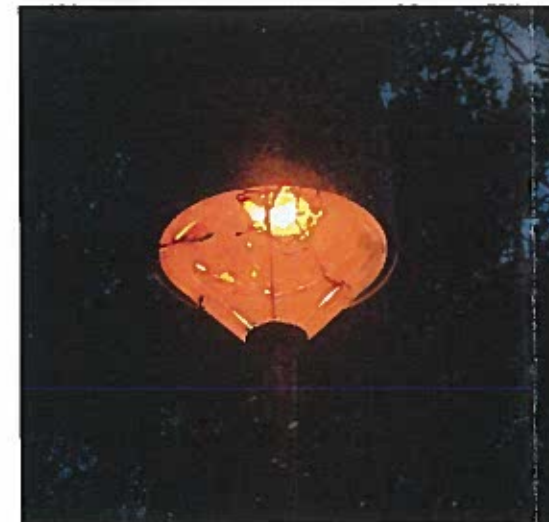
The existing vertical illuminance readings taken along the perimeter of the site ranged from 0.047 fc to 0.10 fc. Best practices for minimizing light trespass beyond the site boundary recommend that illuminance values remain below 0.10 fc for both horizontal and vertical illuminance at the site boundary. The new lighting system will also improve vertical illuminance with proper house-side shielding.



SITE PLAN SHOWING OPERATIONAL AND NON-OPERATIONAL POLE LUMINAIRES



LED REPLACEMENT LAMP

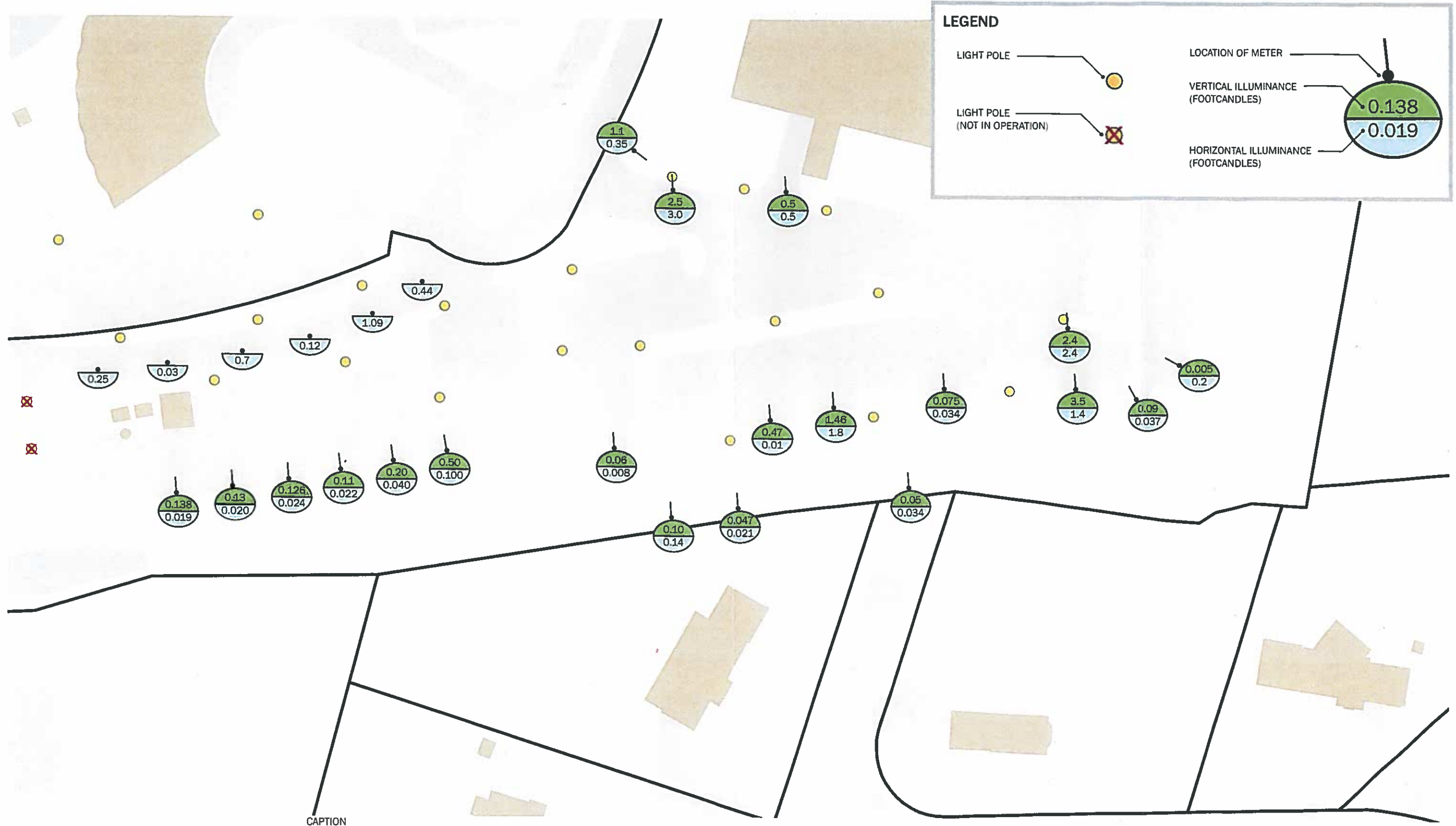


METAL HALIDE LAMP



INDUCTION LAMP

Existing Exterior Lighting Assessment
 8728 Life Time Fitness at High Ridge Park, March 20, 2017



CAPTION

Proposed Exterior Lighting Assessment

8728 Life Time Fitness at High Ridge Park

Proposed System Summary

Atelier Ten evaluated the proposed new lighting system design layout, luminaire specifications, and photometric studies. Color quality, visual acuity, glare control, and light trespass will all improved compared to the existing lighting.

Calculation of the proposed site lighting system and layout was performed in AGI32 software version 17.2.12. The model was provided by Lifetime Fitness for review by Atelier Ten. Horizontal calculation grids in the model are located at the ground plane with measurement points spaced 10'-0" apart. An additional vertical calculation grid was located by Atelier Ten at the site boundary and with points forming a grid from 1'-0" above the ground to an elevation of 20'-0" above the ground. Points were spaced 2'-0" apart.

The proposed new luminaire is a low-profile poletop area light from LSI Industries Inc. The Miranda series proposed consists of a die-cast aluminum housing with molded silicone optics over high-efficiency 154W LED modules, mounted on top of a 20ft tall pole. The specification is one of four configurations (see table below for additional specification information). The correlated color temperature (CCT) for all four variations is a consistent 4000K. All four options share the same LED module but light output is reduced based upon optical characteristics and changes in distribution.

Where poles are located adjacent to and facing away from the property line, an internal louver house side shield is specified. This accessory option uses internal optics to eliminate spill light from the rear of the luminaire and minimizing visual glare from that direction.

Comparison to Existing Condition

The proposed luminaire layout provides better glare control, color quality and visual acuity, plus minimizes light trespass compared to the existing sight lighting. Illumination across the parking surface will have a better uniformity.

The proposed luminaires from LSI Industries Inc. have a photometric profile that focuses light downward to illuminate only the areas that require illumination. This is in contrast to the existing luminaires which have a 360° distribution. The proposed luminaires do not have a prominent lens that will suffer from discoloration and haziness due to time and environmental factors. Eliminating this lens from the equation will drastically reduce the glare caused by these luminaires, particularly when viewed from a distance.

The proposed site lighting layout uses four different luminaire specifications to eliminate as much light spilling beyond the surface of the parking lot. The new luminaire meets Dark Sky recommendations and emits 0% of it's light upwards.

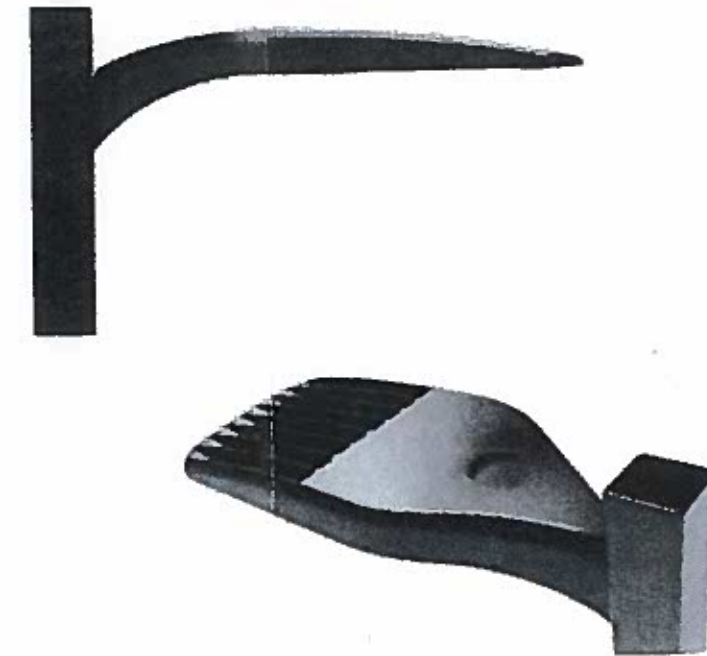
Based on photometric modeling performed in AGI32 software, the proposed horizontal illumination as projected in the parking lots has a maximum of 4.5 footcandles (fc) and a minimum of 0.7 fc. The driving lane illumination maintains an average of 1.83 fc and ranges from 4.6 fc to 0.7 fc resulting in a uniformity ratio of 7:1. These values fall within the Illuminated Engineering Society recommendation for driving lanes in a parking lot is uniformity no higher than 10:1 with an average of 0.6 foot candles.

Recommended Improvements

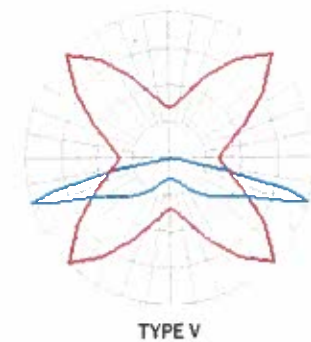
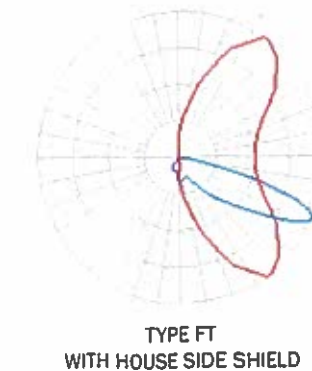
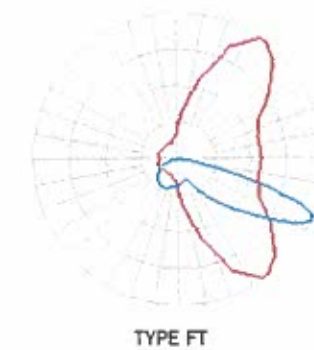
The following are recommendations for optimizing this system to further improve the uniformity and controllability of this system, for consideration by LifeTime Fitness.

To minimize glow from interior lights Atelier Ten recommends the building interior take into account where luminaires have a direct line of sight to the exterior and implement interior shades to prevent glare from these locations. Life Time plans to incorporate this recommendation with their interior design.

To minimize headlight glare from vehicles proceeding in a southerly direction Atelier Ten recommends planting of evergreen vegetation to create a visual barrier to block light from approaching vehicles. Life Time plans to incorporate this recommendation with their landscape design.



MODEL	OUTPUT	DISTRIBUTION	CCT	NOTES
XALM-FT-LED-SS-40-IL	14,000 LUMEN	TYPE FT - FORWARD THROW	4000K	INTERNAL LOUVER HOUSE SIDE SHIELD
XALM-FT-LED-SS-40	18,000 LUMEN	TYPE FT - FORWARD THROW	4000K	
XALM-5W-LED-SS-40	19,000 LUMEN	TYPE V WIDE	4000K	
XALM-5W-LED-SS-40	19,000 LUMEN	TYPE V WIDE	4000K	DUAL HEAD



REFLECTING
POOL

DRIVE

LOT 1

OUTDOOR

PROPOSED

NEIGHBOR 1

LOT 2

NEIGHBOR 2

	Illuminance (Fc)
East Drive	Average=1.83 Maximum=4.6 Minimum=0.1
North Lot	Average=1.98 Maximum=3.8 Minimum=0.3
South Lot	Average=2.15 Maximum=11.1 Minimum=0.0
South Neighbor	Average=0.36 Maximum=2.1 Minimum=0.0
West Neighbor	Average=0.16 Maximum=1.3 Minimum=0.0

SCALE: 1"=25'

STAMFORD, CT

