

August 9, 2021 | Lighting Study

NIGHTTIME LIGHTING STUDY

for St. Anthony High School Athletics Project

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1. St. Anthony High School Athletic Project Nighttime Lighting Study

St. Anthony High School proposes improvements to the 9.6-acre Athletic Complex at 4800 Clark Avenue. The High School campus is eight miles away at 620 Olive Avenue, Long Beach. St. Anthony currently uses portable bleachers with a seating capacity of 1,200 to host spectators at its field events. Existing field lighting is provided by eight lights that appear to be 30 to 40 feet high. These lights are older technology, and the lower pole heights likely create significantly higher glare due to the more horizontal angle of the lights.

St. Anthony High School proposes to replace the existing football/soccer/lacrosse field with synthetic turf, permanent seating for 1,200 spectators and other amenities. Project details are provided below:

- Combined Football, Soccer, Lacrosse Field
 - Synthetic turf field
 - Permanent stadium seating for 1,200 spectators (no increase in capacity from portable rental units)
 - Press box with PA, scoreboard controls, camera platform
 - PA system, elevated from back of grandstands
 - Scoreboard
 - 4-pole, 90- to 100-foot-tall LED lighting
 - Stormwater system
- 400-Meter, 6-Lane, All-Weather Track
 - Rubberized track surface
 - Long/triple jump runways
 - Pole vault/high jump areas
 - Shotput/discus areas
- Parking and Driveway Improvements
- Fencing
- Site Landscaping
- Team Building (locker rooms, restrooms, training, coaches, officials, multipurpose, storage, etc.)
- Restroom/Ticketing Building
- O&M Building with solid waste dumpsters and bus parking

The project would replace the existing lights with the latest technology with LED lights, which are better able to minimize spillover light and glare. The current lights are only 30 to 40 feet in height and as a result, the lights

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direct glare toward the adjacent residences due to their horizontal angle. The proposed lights will be on poles 90 to 100 feet in height, which allows the light to be better directed down to the field where it is wanted. The modern lighting technology also provides glare shields, which provides additional protection for adjacent residences. Finally, the new technology allows greater control to and reduce light levels when competition ceases and exiting the stadium begins.

The project's conceptual lighting plan includes sport lighting and ball tracking lighting. All lighting would be installed in conformance with the City's exterior lighting requirements. Lighting would be directed downward and shielded to minimize spill-light and glare. Table 1 presents details of the proposed lighting fixtures in each light pole.

Table 1 Light Fixtures in Each Light Pole

ID	Pole Height	Light	Manufacture	Fixture	Mounting Height	Fixture Qty.	Load	Circuit
F1-F2	90'	Sport Lighting	MUSCO	TLC-LED-1500	90'	10	14.30 kW	Football
		Ball Tracking Lighting	MUSCO	TLC-BT-575	16'	2	1.15 kW	Football
F3-F4	100'	Sport Lighting	MUSCO	TLC-LED-1500	100'	9	12.87 kW	Football
		Sport Lighting	MUSCO	TLC-LED-400	100'	1	0.40 kW	Egress
		Ball Tracking Lighting	MUSCO	TLC-BT-575	25'	2	1.15 kW	Football

Source: Musco 2021

Lighting, PlaceWorks simulated the lighting performance under nighttime conditions and predicted the illumination levels across the site and adjacent areas. With the use of AutoCAD 2022 and SketchUp 2019, a model was created and used in Autodesk® 3ds Max® 2017 to light the study site. The information input to the model includes the field, existing and proposed buildings, bleacher, location and height of the light poles, levels and distribution of luminaires, as well as the surrounding neighborhoods. The analysis does not include any pedestrian lighting, interior lights, moonlight or other sources of lights. Moreover, the impacts from dust, ground covers, plants, or any structures that might partially or entirely block light sources does not account in the process.

Foot-candle is a measure of illuminance or light intensity. The foot-candle is equal to one lumen per square foot. The lighting analysis indicated that the horizontal light levels across the football field is at average 50 foot-candles and the seating area is at average 5 foot-candles. These meets the Illuminating Engineering Society of North America (IES or IESNA) standards for sports and recreational uses.

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Light intensity drops significantly away from the stadium to a maximum of 0.7 fc along the nearest residential edge, and under 0.2 fc along the adjacent streets. The light spill criteria used is per the County of Los Angeles. According to County of Los Angeles, no lighting fixture shall create illumination that exceeds 2.0 fc outside of the project site boundary, thus the proposed lighting fixtures do not cause a significant impact to adjacent residences.

Figure 1, Horizontal Illuminance, provides the horizontal illuminance level across the site. It was taken at 3-ft elevation surface. Figure 2, Top View Rendering, provides the illuminating pattern and the projected lighting level. Figure 3 and 4, Bird's Eye View Rendering, provides a simulated rendering of the proposed football field and surround environment.

2. Conclusion

The projected light levels at the nearest residential property line ranges from 0.2 to 0.7 fc, which is considerably below the significance threshold of 2.0 fc. Given the greater ability of new LED lighting technology to control light spillover, the light and glare at the adjacent residences would be reduced compared to the existing low height, horizontal-angled, older-technology lights.

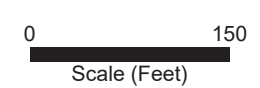
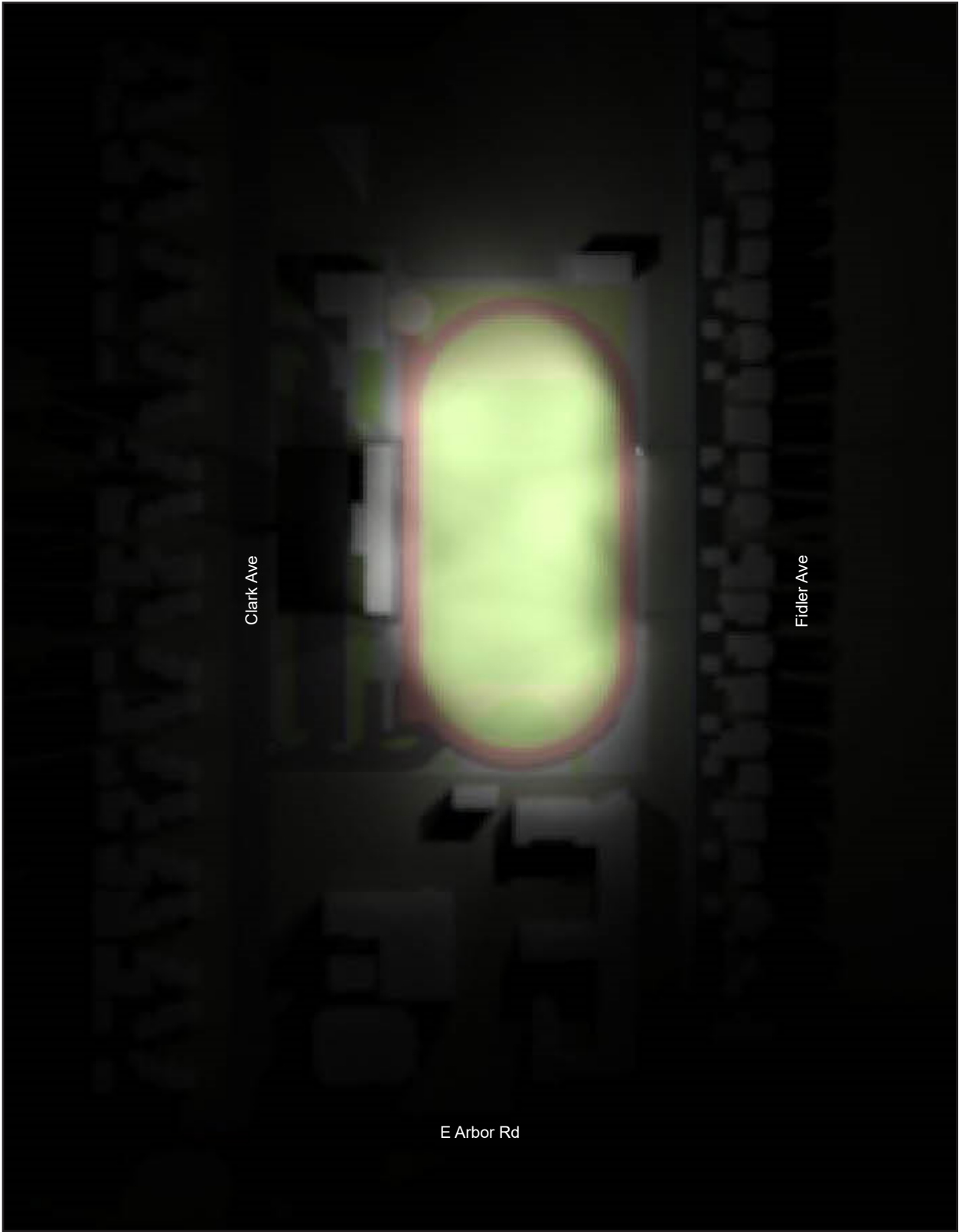


Figure 2 - Top View Rendering
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Clark Ave

Fidler Ave

E Arbor Rd

0 170
Scale (Feet)



Figure 3 - Bird's Eye View Rendering-Looking East Towards Nearest Residential Property
Nighttime Lighting Study

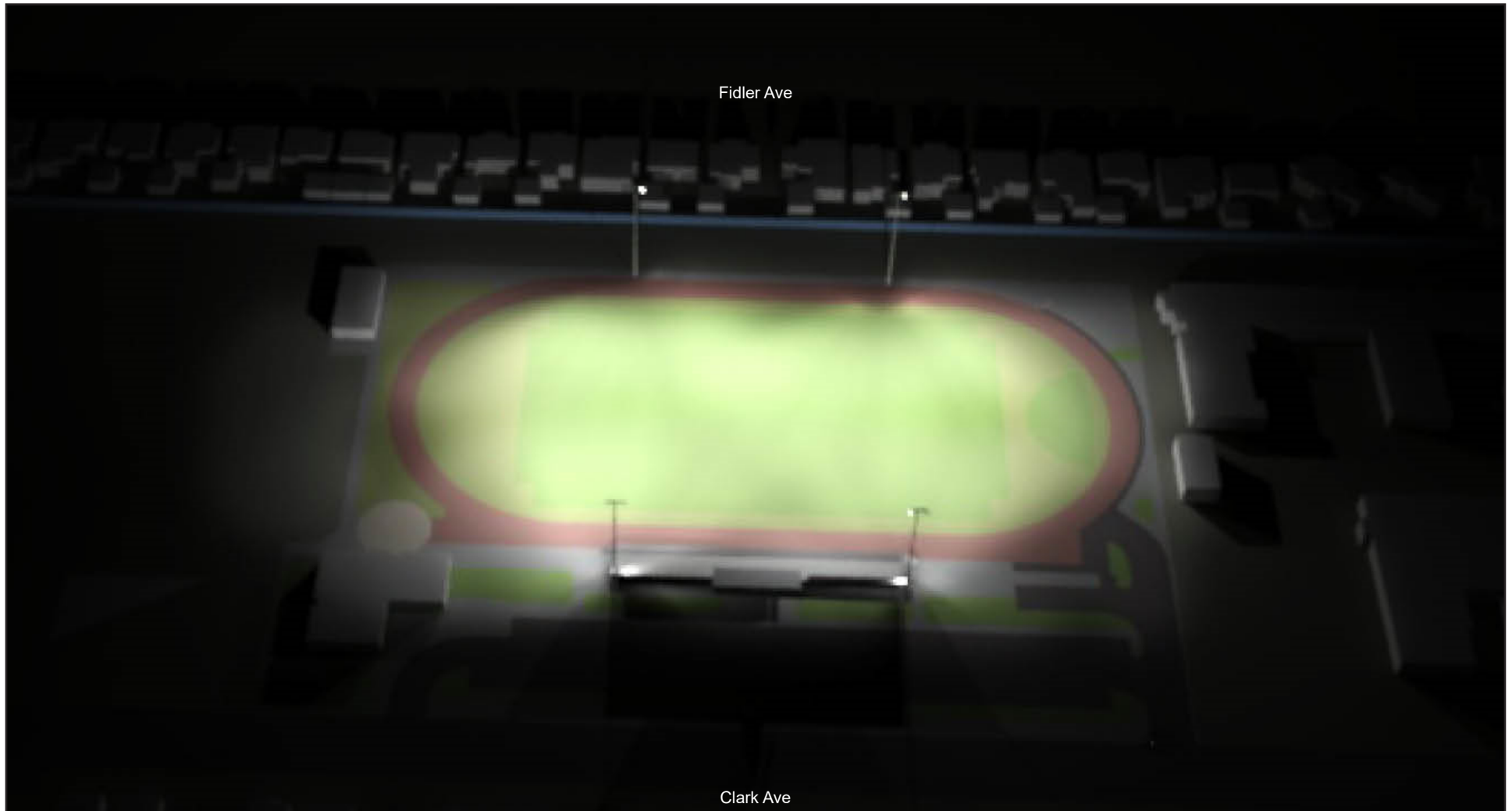


Figure 4 - Bird's Eye View Rendering-Looking West Towards the Bleacher
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