



KAPLAN GEHRING MCCARROLL
ARCHITECTURAL LIGHTING

Lighting Design Narrative- S E Q R Submission

DATE: September 29, 2022

PROJECT: BUFFALO BILLS STADIUM
KGM # 22.0066.00

The Buffalo Bills, Western New York's National Football League ("NFL") franchise team, currently plays its home games at Highmark Stadium ("Existing Stadium"). The Existing Stadium is located on the east side of Abbott Road and is part of an approximately 242.54-acre complex owned by Erie County. The Existing Stadium, opened in 1973, is approaching the end of its useful life, particularly in light of change in NFL stadium requirements over the last 50 years. As such, Erie County is currently evaluating the construction of a new 1,325,000 square foot stadium consisting of eight to nine levels with a seating capacity between 60,000 – 63,000 ("New Stadium") and the demolition of the Existing Stadium (the "Project"). Parking will be located at the site of the Existing Stadium. Additionally, an approximately 75,000-square-foot auxiliary building will be constructed just south of new stadium. The New Stadium, along with the ancillary building, parking lots east and west of Abbott Road, and the Existing Stadium's ancillary buildings such as the Bills Team Store, the ADPRO Complex, and the outdoor practice fields for the team will comprise the approximately 242 acre New Stadium Complex ("New Stadium Complex".) KGM has performed an analysis of the lighting currently in place at the Existing Stadium as compared to the proposed lighting for the New Stadium Complex and offers the following summary and analysis.

EXISTING STADIUM LIGHTING

At the Existing Stadium, field lights are mounted on freestanding posts which extend above the structure of the Existing Stadium, making them visible to surrounding properties. These lights are unshielded, giving them a glary appearance. The upper concourse and ramps of the Existing Stadium are open to the sky and surrounding parking lots, making them very visible from the exterior. Therefore, the lighting that people see from the exterior of the Existing Stadium is coming from these ramps and concourses and is not related to any exterior design expression. The parking lot post lights at the Existing Stadium are very tall, creating more glare for neighboring properties, and uneven illumination at the parking lots. All the above-mentioned lighting is older technology and is less energy efficient than current lighting technologies that will be implemented at the New Stadium. Illuminance

readings from the Existing Stadium have been taken at locations along public roads and adjacent properties surrounding the Existing Stadium and are documented in the attached Exhibit A.

NEW STADIUM LIGHTING

Site lighting for the New Stadium Complex will be minimally used to provide the appropriate amount of light for pedestrian safety and to highlight focal points of the New Stadium in a restrained manner. Lighting will be thoughtfully placed to be respectful of neighboring people and properties. Sky glow will be limited so that it is no greater than that coming from the Existing Stadium. In developing the lighting design for the New Stadium, KGM is using a national lighting standard recommended by the Illuminating Engineering Society ("IES"), the recognized technical and educational authority on illumination, for pedestrian safety. In this standard, areas to be evaluated are classified by the amount of light in the surrounding environment, on a scale from 0 (national parks, with almost no exterior lighting) to 4 (very dense urban environments, with a very high amount of exterior lighting). The lighting zones which apply to this site are IES Lighting Zone 2, which is classified as mixed-use residential, with a moderate amount of exterior lighting, and IES Lighting Zone 3, which is classified as business districts, with a higher amount of exterior lighting. The plazas directly surrounding the New Stadium will meet light level recommendations from the IES for pedestrian safety in Lighting Zone 3 (business districts), while the surrounding parking lots and pedestrian pathways will meet IES recommendations for pedestrian safety in Lighting Zone 2 (mixed use residential). Care will be taken at the edges of the property so that there is no light trespass (no light spillage) onto the neighboring properties. Well-shielded LED light sources and warm color temperatures will be used throughout the site to minimize light pollution. Any site lighting abutting residential properties will not exceed 7000 lumens per fixture. No new properties which could not previously see the lighting at the Existing Stadium will be impacted by the lighting at the New Stadium. For reference, as noted above, illuminance readings were taken at locations along public roads and adjacent properties surrounding the Existing Stadium to create a baseline for comparison. In the final lighting design, calculations will be performed to ensure that readings at these identified points will have the same amount of light, or less, when the New Stadium is in operation. See attached Exhibit A.

FEATURE ENTRY PLAZA

As the prominent entrance for visitors along Abbott Road just south of Southwestern Boulevard, a circular plaza will be lit to light levels recommended for IES Lighting Zone 3. A limited number of trees will be lit with in-grade uplights, framing the promenade. Multihead post lights will be tucked amongst the trees to provide an overall wash of light to the walkways for pedestrian safety. All uplights will be turned off after close of business to reduce any potential impacts to local wildlife populations (see Controls section below). The multihead post lights will emit light in a downward direction only.

SCREENING GATES

Underneath the canopy, backlit elements will provide task lighting for security. The backlit elements will emit light in a downward direction only.

NORTH ENTRY PLAZA

The North Entry Plaza, similar to the circular Feature Plaza, will have the most fan activity. As such, it and other New Stadium entry points will be lit to light levels recommended for IES Lighting Zone 3. A limited number of trees will be lit with in-grade uplights, framing the plaza. Multihead post lights will be tucked amongst the trees to provide an overall wash of light to the walkways for pedestrian safety. All uplights will be turned off after close of business to reduce potential impacts to local wildlife populations, including bird and bat populations. See Controls section. The multihead post lights will emit light in a downward direction only.

SURROUNDING PARKING LOTS, ENTRY DRIVES, AND PEDESTRIAN PATHWAYS

The parking lots, entry drives, and pedestrian pathways of the New Stadium Complex will be lit to light levels recommended for IES Lighting Zone 2. To maintain minimal sky glow, Dark Sky compliant bollards will line pedestrian pathways to guide visitors to the stadium. At the West Entry, a limited number of trees will be lit with in-grade uplights, framing the promenade. No other trees will be lit in this area. All uplights will be turned off after close of business to reduce potential impacts to local wildlife populations (See Controls section below). Dark Sky compliant post lights will be used to create an even wash of light in the parking lots and entry drives, per IES recommendations. These post lights will be shorter than the parking lot lights currently in use at the Existing Stadium. Optics and house side shields will be carefully chosen to ensure that light is only falling where needed for pedestrian safety in the parking lots and pathways, and not beyond. By doing so, there will be no light trespass (light spillage) onto neighboring properties from this lighting. Careful studies and due diligence will occur during final lighting design for the New Stadium Complex to ensure this.

BUILDING FACADES

At the façade of the New Stadium, architectural lighting will be employed in a restrained manner to emphasize the architectural expression of the facade and provide some light for the entry plazas closest to the building. The ramps and concourses of the New Stadium are interior focused, and therefore lighting for these spaces will not be expressed to people viewing the stadium from the exterior, as is the case with the Existing Stadium's open ramps and concourses.

ENTRIES

At each main entry to the New Stadium, backlit signage will display the name of the stadium. At the East and West entries, lights from the multihead posts in the plaza will be used to wash potential facade graphics from the front.

The façade lighting will be turned off after close of business. See Controls section below.

PLAYING FIELD LIGHTING

The field lighting at the New Stadium will be integrated into the architectural structure of the roof canopy, as opposed to projecting above the stadium on independent posts as with the Existing Stadium. As such, visibility of these lights from neighboring properties will be drastically reduced. The field lighting will limit the spill illumination to the surrounding neighborhoods and at the property line to 1.0 footcandles, a reduction from the Existing Stadium lighting (See Attachment A). The lighting design will limit the glare to a threshold of 40GR at motor intersections around the stadium.

All of the above-mentioned lighting, for the site, parking lots, building, and playing field, will be energy efficient LEDs.

CONSTRUCTION

Lighting on the construction site during work hours will be provided locally at lighting levels per OSHA Standards to maintain a safe work environment for all workers. Lighting on the construction site after work hours will be limited to Security Guard Booth areas, 24-hour Fire Department access, egress points, and emergency egress stairs per Building Department and Fire Department codes. Lighting on the exterior of the construction site will be provided to maintain continuity and construction worker safety at all sidewalks, roads/roadways, and parking lot areas per code and local standards. The work hours will be:

Monday-Friday: 6am – 11pm

Saturday: 7am-6pm

Sunday: 8am-5pm

LIGHTING CONTROLS

All façade and site lighting at the New Stadium is intended to be controlled via a timeclock integrated with the overall controls system. The control system will allow for modifications and creation of multiple lighting scenes or scenarios. Appropriate fixture wattages will be selected with the surrounding environment and energy codes in mind. Three potential scenes may primarily be used:

- a game day/special event scene with all landscape lighting, façade lighting, and screening gate lighting on. The bowl lighting will be turned off two hours after the completion of a game/event. Site lighting will remain on as necessary to allow for post-game / post-event cleaning to take place. Priority will be given to areas adjacent to residential properties so that lighting can be turned off once complete, consistent with the current practice at the Existing Stadium.

- an evening scene for ordinary days to include all landscape lighting on and all façade lighting on between the time of sunset and close of surrounding businesses, which will allow for fans to come and visit the Feature Plaza and take photos.
- an overnight scene with only the lights needed for safety to be left on.

WILDLIFE

Site lighting will be designed to limit potential impacts to wildlife including birds and bats that might be flying over or past the property and improve upon existing conditions. The well-shielded LED light sources that will be used throughout site will help minimize skyglow, which can be disorienting to birds and bats. Warm color temperatures, which are proven to have the least impact on birds and bats, will be used throughout the site. The controls will also be used as described above to limit the number of lights that are on at night, to help protect the sleep-wake cycles and reproductive patterns of surrounding wildlife.

Potential impacts to wildlife, including birds and bats, from lighting at the New Stadium will be reduced as compared to the Existing Stadium. This is due to the integration of field lighting into the roof canopy, as opposed to projecting above the Existing Stadium on posts, the partial enclosure of the New Stadium as compared to the open upper concourse and ramps of the Existing Stadium, the use of newer technology and lighting controls, LED light sources, warm color temperatures and dark-sky compliant lighting. Further, the relocation of the New Stadium across the street will also reduce the impact of light on wildlife species potentially utilizing the Smokes Creek area to the east of the site of the Existing Stadium, especially during game days and special events.

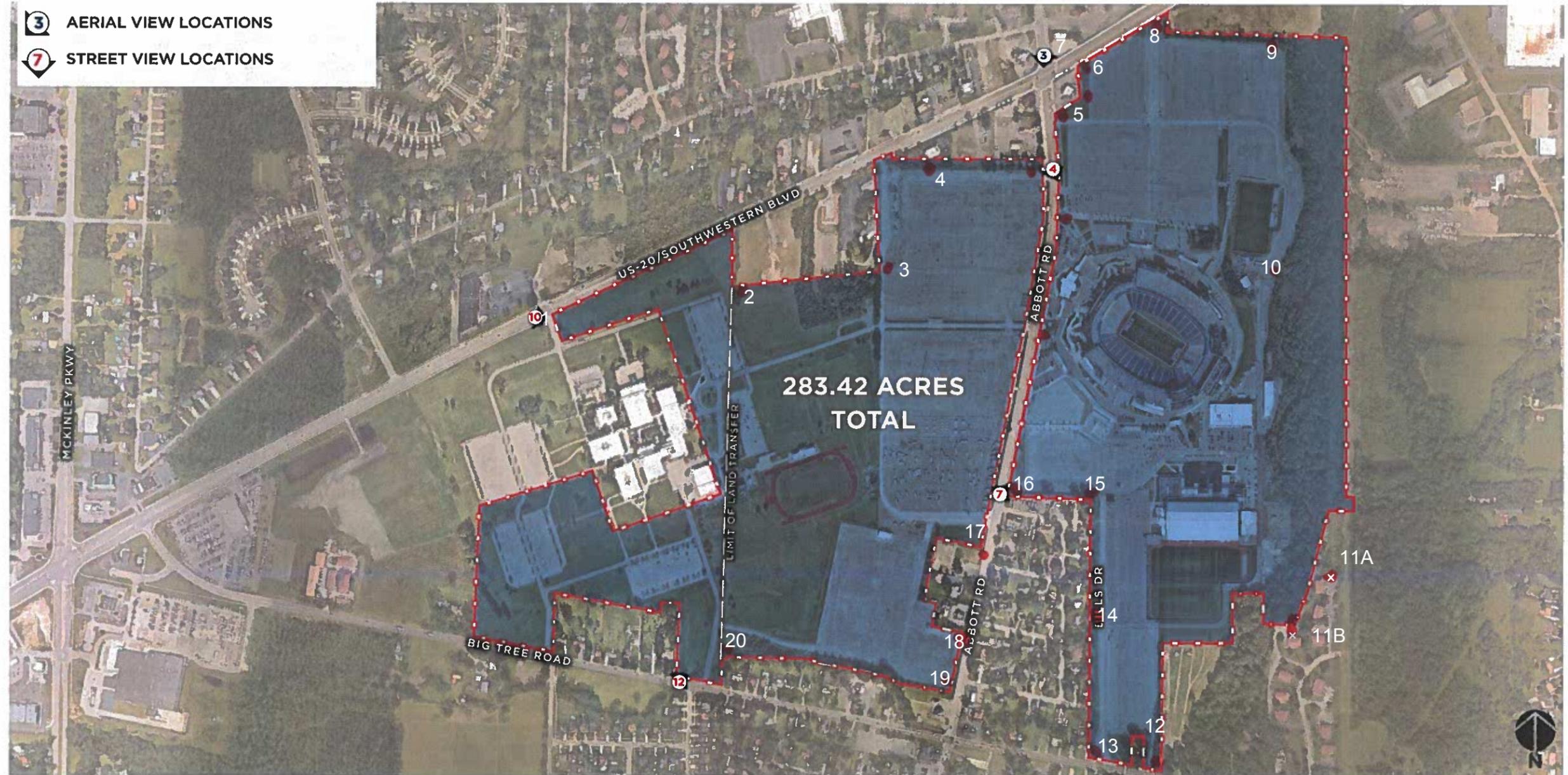
CONCLUSION

As demonstrated by the foregoing, the New Stadium has been thoughtfully and specifically designed to limit light impacts to adjoining properties, roadways and wildlife during both construction and operation. Further, given the relocation to the west side of Abbott Road, away from the Smokes Creek area, the partial enclosure of the New Stadium as compared to the open Existing Stadium, and the use of new lighting technology and controls serves to reduce potential impacts from lighting at the New Stadium, as compared to the baseline of the Existing Stadium.

EXHIBIT A

PROJECT AREA PLAN

-  AERIAL VIEW LOCATIONS
-  STREET VIEW LOCATIONS



Map Location	Lights on (footcandle)	Lights off (footcandle)
1	0.56	0.54
2	0.67	0.32
3	0.18	0.08
4	0.10	0.10
5	0.62	0.08
6	1.23	0.34
7	1.40	0.96
8	0.60	0.08
9	0.31	0.02
10	0.04	0.00
11a	0.01	0.02
11b	0.05	0.03
12	0.15	0.08
13	0.32	0.06
14	0.26	0.00
15	0.34	0.00
16	0.24	0.06
17	0.06	0.02
18	0.17	0.06
19	0.16	0.04
20	0.70	0.48

- a. Lighting calculation readings taken on 09/01/2022 and 09/16/2022
- b. Readings are for horizontal illuminance taken at night
- c. Meter used: Extech HD450 Datalogging Heavy Duty Light Meter