9801 Renner Boulevard
Lenexa, KS 66219

MEMORANDUM

To: Keith Moody, City Administrator

From: Matt Graviett, GBA Project Manager

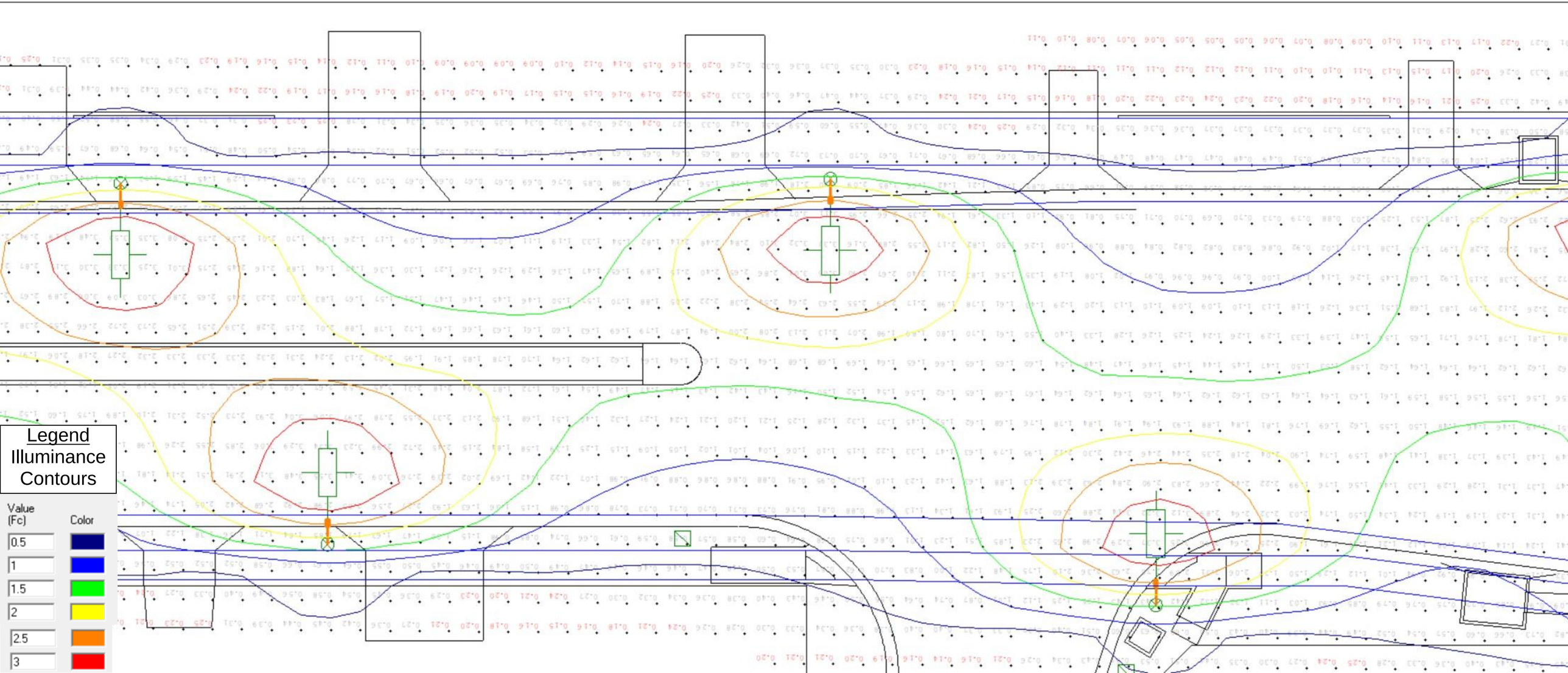
Date: December 23rd, 2021

Subject: Roe Boulevard – Street Lighting Design

The street lighting system along Roe Boulevard was designed to meet criteria set forth by the Illuminating Engineering Society (IES) in their RP-8 “Roadway Lighting” document, which is considered to be the industry-standard guidance. While there are no federal, state, or local requirements for street lighting design, RP-8 is considered the “best practices” and its recommended criteria were followed while designing the lighting for Roe Boulevard. The design was for a “major arterial” roadway, with a “medium” level of pedestrian conflict areas. Based on these classifications, the streetlights are placed to properly illuminate the roadway, as well as the adjacent sidewalks, to meet the associated RP-8 criteria. This design helps to balance drivers’ need to see the roadway, as well as obstacles, other vehicles, and pedestrians, with the appropriate amount of nearby nighttime activity. With the minimal backlight projection from these specified street light fixtures, the adjacent sidewalks are well-lit, while still minimizing the spillover of light behind the streetlights toward the abutting residences. See attached photometrics display that reflects illumination level contours in foot candles. The streetlights are in different locations than they used to be based on the illumination distributions so the visibility of each light will be different than before.

The Lineal fixtures selected for this corridor were designed to maximize output performance while keeping a clean lined fixture at competitive costing. The lighting designer selected IP67 gasketed optics from LEDil, a trusted name in LED lighting, mounted over the LED module and flush with the bottom of the fixture body. These fixtures have an excellent BUG (Backlight-Uplight-Glare) rating of B1-U0-G1 (measured on a 0-5 scale, 0 being the best, 5 being the worst), meaning they have minimal backlight, no uplight, and minimal glare (or high angle light, as opposed to light pointed straight down at the ground). Additionally, based on the completed design layout, these selected fixtures are 10,600-lumen LEDs, which is sufficient to meet the required RP-8 criteria. However, their output is far less than an equivalent 250W high pressure sodium (HPS) light would have been (typically 25,000 - 30,000 lumens), which is what they are replacing. Illumination from LEDs can be much better directed and controlled, with much less “light loss” than the older HPS fixtures, which allows them to operate more efficiently and with reduced power costs. Furthermore, these lights have a color temperature of 4,000 degrees Kelvin, a color closer to a true ‘white’ than the more ‘yellow-orange’ tinted HPS lights that were previously used. This color temperature helps drivers and pedestrians alike to be able to see more clearly and more accurately than with the older lighting types.

The photometric display with illumination level contours shows that very little to no illumination should reach the houses along Roe (note that the photometrics display only shows approx. 25’ behind the lights but most houses are 50’ away). The challenge is providing the lighting levels required by the design standards while minimizing the impact to the adjacent residents, which is what was done here. It’s a delicate balance. These lights will still be visible by residents even though they are not illuminating the houses.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