Street Light Illumination Memo

Date: July 31st, 2025

Project: City of Tualatin SW 108th Ave Reservoir and Pump Station

To: City of Tualatin
Engineering Division

From: Hannah Long, PE

Reviewed By: Jonathan Gellings, PE

Re: Photometric Analysis Report

Introduction

The purpose of this memorandum is to present the results of the photometric analysis performed for the existing conditions of the City of Tualatin SW 108th Ave Reservoir and Pump Station project. The illumination scope for this project includes performing a photometric analysis of the existing roadway illumination system along 108th Avenue within the project extents, including the intersection of 108th Ave and SW Dogwood St. The standards used for the analysis are from the ANSI/IES RP-8-22: Design of Roadway Facility Lighting guide. All existing equipment (luminaires and poles) is owned by the City of Tualatin and operated and maintained by Portland General Electric (PGE).

Background and Assumptions

Existing Infrastructure

Existing lights are present along and adjacent to the 108th Ave corridor. Consor performed a site visit and identified 6 total fixtures within the project extents to be included in the photometric analysis. Three different PGE fixtures were encountered during the site visit and are outlined below.

- LEOTEK GreenCobra GCJ1-20H-MV-WW-2R-XX-450 S – 29 Watts, Type III Distribution
- LEOTEK Post Top Colonial PTC-S-F-N-S-30J-MW-30K-3R-XX – 34 Watts, Type III Distribution

Assumptions

Several assumptions were made during the photometric analysis and calculation process, which are summarized here.

Roadway classifications are based on the City of Tualatin's Existing Road Functional Classification and Traffic Signals map, which is derived from the City's GIS software, TualGIS. Based on Consor's field visit and visual inspection, mounting heights of 25-feet and 16-feet were used for the cobrahead style and post-top lantern style luminaires, respectively, that were modeled using AGi32 lighting analysis software.

Based on guidance from IES RP-8-22, a pedestrian activity level of Low was selected due to the residential land use surrounding the project.

The criteria used for this analysis are limited to average horizontal illuminance and uniformity ratio. With the pedestrian activity level and roadway classification defined, target values were then identified, which are summarized in Table 1 below.

Table 1: Calculation Area Target Values

Description	Roadway Functional Classification	Side Street Fucntional Classification	Pedestrian Activity Level	Avg. Illuminance (fc)	Max. Uniformity Ratio (Eavg/Emin)
Roadway – Horizontal Illuminance	Collector	N/A	Low	0.6	4.0
Intersections – Horizontal Illuminance	Collector	Local	Low	0.9	4.0

A light loss factor (LLF) of 0.85 was assumed for all LED luminaires. Roadway illuminance calculation limits extend to the edge of pavement or face of curb. Intersection illuminance limits are bounded by the curb radius return.

Photometric Analysis Results

Table 2 below summarizes the photometric analysis results of existing conditions by calculation area.

Table 2: Photometric Analysis Results Summary - Roadway & Intersection Calculation Areas (Illuminance Criteria)

Calculation Area No.	Description	Avg. Horizontal Illuminance (fc)	Max. Uniformity Ratio (Eavg/Emin)
1	Roadway – North Limit to SW Dogwood St	0.31	N/A
2	Intersection – SW 108th Ave/SW Dogwood St	0.33	N/A
3	Rodway – SW Dogwood St to South Limit	0.36	N/A

Summary and Recommendations

The table above reflects the light level and uniformity ratio results from a layout of 6 existing luminaires. Uniformity Ratio values of N/A are due to the defined calculation areas containing values of 0.0 fc. The results of the AGi32 photometric analysis shown above in Table 2 illustrate that the existing illumination system within the project area does not meet the recommendations outlined in ANSI/IES RP-8-22. The City of Tualatin would need to revise the layout of the existing illumination system or add additional lighting fixtures to meet the recommended light level criteria.

Signature:

Hannah Long, PE