Lighting Design Analysis Report

[Project Name]

[Project Description]

[Project Location (County)]

Project FPID: [######-#-##-##]

Prepared for:

Florida's Turnpike Enterprise
Mile Post 263, Building 5315
Ocoee, FL 34761

Prepared by:

[Company Name]
[Company Address]
[Company City, State]
[Company Certificate of Authorization]

Submission Information: [Phase ## (## %)]
Submission Date: [##/##/####]

Project: [Project Name]
Project No.: [FPID XXXXXX-X-XX-XX]
Scope of Responsibility: [Description]
Section(s) / Page Range(s): [Sections X.X through X.X]

I certify that the engineering features in this Lighting Design Analysis Report have been designed by me or under my responsible charge and in my professional opinion conform to sound engineering principles and all applicable rules and specifications.

The official record of this document is the electronic file digitally signed and sealed under rule 61G15-23.004, F.A.C.

*Show digital seal/signature here.

[EOR's Name], P.E., State of Florida, Professional Engineer, License No. [XXXXX]
[Company Name]
[Company Address]

This item has been digitally signed and sealed by [EOR's Name], P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

*Provide multiple signatures/seals for multiple EOR's and describe sections for which each EOR is taking responsibility, as applicable. Duplicate the above as necessary.

Table of Contents

Notes to Consultants:

- *All design considerations must be documented in the LDAR.*
- *Design Exceptions, Design Variations, and deviations from Turnpike standard practice and guidelines must be identified separately in the Table of Contents and fully clarified under the "Design Methodology" sub-sections of the LDAR.*
- *Correspondence regarding deviations from criteria should be included as an appendix to the report and referenced as needed for clarification. A summary of deviations from FDOT criteria described in the design methodology shall be documented in the "Conclusions" section of the LDAR.*
- *Coordinate with maintaining agencies, as well as other Department stakeholders as applicable, to ascertain their standard practices and guidelines and obtain all other pertinent information required to provide an acceptable design.*

Section 1 – General Description

- Describe project location.
  - Provide location map (if required).
- Describe the type and general condition of the existing light fixtures, poles, and electrical equipment (load centers, enclosures, pull boxes, etc.) within the project limits.

Sections 2, 3, 4 – [Roadway, Underdeck, Sign] Lighting

[2, 3, 4].1 - Design Methodology

- Describe how the lighting design was developed.
  - Discuss design alternatives (if required).
- Describe reference standards, criteria, etc. used.
- Describe lighting criteria.
  - Designate and Describe design deviations/variations from criteria. Identify criteria that cannot be met by the design, along with limitations and design consultant recommendations.

    For example only:
    "DEVIATION/VARIATION #1: FDM 231 Table 231.2.1, horizontal illumination level average foot-candle values cannot be met using wall mounted fixtures only due to the width of the roadway, bridge wall spacing, and lack of center roadway bridge pier columns. Design consultant has coordinated with FTE stake holders and recommends the use of pendant hung fixtures with additional support structure to supplement the proposed wall mounted lighting at this location. Layout, plans, and details for this pendant hung lighting have been submitted to the Department for review, along with a request FDOT Central Office to open a project specific pay item. Pay item approval is pending. If pendant hung fixtures are not approved, the roadway beneath the bridges at this location may not meet

average horizontal illumination. However, the design consultant EOR does not see this condition as a major issue since the average is 1.47 foot-candles and drivers will experience this condition only momentarily while passing beneath."

- Describe any standards and specifications for light fixtures.
- Describe software used.
- Describe calculation methodology.
- Describe calculation assumptions.

[2, 3, 4].2 - Photometric Analysis

- Provide luminaire schedule from software.
- Provide calculation summary from software.
- Provide location map showing photometric calculation zones (if multiple zones used).
- Provide legible point by point calculations (11" x 17" pages).
- Provide a copy of the software photometric design file with the report.

[2, 3, 4].3 - Luminaires

- Provide luminaire cut sheet from manufacturer.
- Indicate complete catalog number.

Section 5 – Airspace Obstruction Analysis

- Provide evaluation of proximity to airport(s) and/or heliport(s).
- Provide evaluation of project site(s).
- Provide analysis of project site and nearby airport(s) and/or heliport(s) against CFR, Title 14, Part 77, 77.9 criteria.
- Provide copies of FAA Forms 7460-1 (if required) or provide "No Airspace Obstructions Letter".

Section 6 – Load Analysis

- Provide load summary for each circuit and for the load center.

Section 7 – Voltage Drop Calculations

- Provide voltage drop summary for each circuit and for the load center.
- Provide voltage drop calculation for each circuit and for the load center.
- Provide all equations and data used in the calculations.

Section 8 – Short Circuit Analysis and Device Coordination

Short Circuit Analysis - (For manual calculations)

- Provide available fault current summary for each piece of electrical equipment.
- Provide available fault current calculation for each piece of electrical equipment.
- Provide one-line/riser diagram.
- Provide all equations and data used in the calculations.

Short Circuit Analysis - (For software based analysis)

- Provide data input summary for one-line/riser diagram.
- Provide one-line/riser diagram.
- Provide calculation summary from software.

Device Coordination

- Provide description of design considerations and device coordination methodology.
- Provide overlays of time current curves as needed.

Section 9 – Arc Flash Hazard Analysis

- Provide data input summary for one-line/riser diagram.
- Provide one-line/riser diagram.
- Provide calculation summary from software.
- Provide copies of all arc flash labels.

Section 10 – Conclusions

- Document all major design decisions.
- Document any “non-standard” design items.
- Document any items that the Turnpike should consider for this project or future projects.