



**EJM ENGINEERING, INC.**

**January 23, 2017**

**LED STREET LIGHTING INSTALLATION AND SUPPORT SERVICES  
LAKE COUNTY, ILLINOIS  
Section No. 16-00999-27-LT  
PHASE II ENGINEERING SERVICES**

**GENERAL SCOPE - PHASE II ENGINEERING SERVICES**

The scope of EJM Engineering, Inc. (EJM) design services for this project consists of the preparation of final Plan, Specification, and Estimate (PS&E) documents for the installation LED street lighting luminaires on existing poles within the boundaries of Lake County, Illinois. The scope of EJM design services will also include modification of the existing roundabout lighting installation at the Cedar Lake Road and Monaville Road Roundabout. Existing high pressure sodium (HPS) light fixtures at the Deerfield Road/I-94 and Washington Street/I-94 underpasses will also be replaced with new LED underpass fixtures.

**Scope of Services – EJM Engineering, Inc.**

**1. MEETINGS AND COORDINATION- 24 hours**

EJM will attend coordination meetings with Lake County Division of Transportation to complete the scope of services. EJM will also coordinate the proposed LED lighting installation and energy requirement with the local Electric Utility Company- 24 hours

**2. DATA COLLECTION – 60 Hours**

EJM will collect and review data to complete the scope of services:

- A. Research and develop a white-paper regarding the medical and human concerns and benefits of LED lighting - 16 hours
- B. Conduct field surveys for the proposed LED street lighting retrofit work- 28 hours
- C. Review of existing street lighting inventory log and as-built plans- 16 hours

**3. LED FIXTURE SELECTION– 36 Hours**

EJM will research and review existing LED luminaires specifications from various manufacturers and agencies in an effort to select most appropriate LED light fixture for the intended application.

- A. Develop Specification for street lighting LED luminaire- 12 hours
- B. Develop Specification for underpass lighting LED luminaire- 12 hours
- C. Develop Specification for intersection lighting LED luminaire- 12 hours

**4. DEVELOPMENT OF GUIDE INTERSECTION LIGHTING LAYOUTS– 40 Hours**

EJM will develop various intersection LED lighting Guide layouts for various roadway and intersection configurations. The proposed Guide layouts are intended to only serve as design



templates for future intersection lighting design projects; however, the design templates will be checked and validated for the intended application.

- A. Photometric Calculations for LED Intersection Lighting- 8 hours
- B. Develop Guide layout for a 3-lane intersections- 16 hours
- C. Develop Guide layout for a 5-lane intersection- 16 hours

## **5. PREPARATION OF FINAL PS&E DOCUMENTS FOR STREET LIGHT LED RETROFIT AT 114 SIGNALIZED INTERSECTIONS- 148 Hours**

EJM will prepare final PS&E documents for replacement of existing HPS roadway lighting luminaires with LED luminaires at 114 signalized intersections.

- A. Preparation of LED retrofit plans- 120 hours
- B. Preparation of Special Provisions- 16 hours
- C. Preparation of Summary of Quantities- 8 hours
- D. Preparation of Estimate of Cost- 4 hours

## **6. PREPARATION OF FINAL PS&E FOR ROUNDABOUT LIGHTING DESIGN- 354 Hours**

EJM will evaluate the existing lighting system at the Monaville Road and Cedar Lake Road Roundabout for potential relocation of some of the existing light poles due to repeated knockdowns; existing HPS luminaires will be replaced with LED luminaires. EJM scope of work will also include the validation of the existing lighting systems in conjunction with the installation of LED luminaires at the three (3) additional Roundabouts: (a) Riverwoods Road and Everett Road, (b) Wadsworth Road and Hunt Club Road, and (c) Hunt Club Road and Millburn Road.

### **A. LED Lighting Retrofit and Pole Relocation at Existing Roundabouts**

- i. Photometric Calculations to Validate LED Lighting Retrofits- 16 hours
- ii. Preparation of LED retrofit plans- 64 hours
- iii. Preparation of Pole Relocation Plans at Monaville Road and Cedar Lake Road Roundabout- 40 hours
- iv. Preparation of Pole Relocation Plans for other Roundabout locations as directed by Lake County Division of Transportation- 40 hours
- v. Preparation of Special Provisions- 8 hours
- vi. Preparation of Summary of Quantities- 4 hours
- vii. Preparation of Estimate of Cost- 4 hours

### **B. New Roundabout LED Lighting Design and Final PS&E Plan Preparation.**

The scope of work under this item will include a complete roundabout lighting design and PS&E plan preparation for one (1) additional future roundabout installation.

- i. Data Collection and Field Survey- 12 hours
- ii. Photometric Calculations for new roundabout lighting system- 16 hours
- iii. Preparation of proposed roundabout LED lighting PS&E plans- 108 hours
- iv. Preparation of Wiring Diagram and Electrical Detail- 28 hours
- v. Preparation of Voltage Drop Calculations- 4 hours



- vi. Preparation of Special Provisions- 4 hours
- vii. Preparation of Summary of Quantities- 4 hours
- viii. Preparation of Estimate of Cost- 2 hours

**7. PREPARATION OF FINAL PS&E FOR UNDERPASS LED LIGHTING RETROFIT- 72 Hours**

EJM will prepare PS&E plans for the replacement of existing HPS underpass luminaires with LED luminaires at the I-94 at Deerfield Road and at Washington Street Underpasses. EJM scope of work will also include lighting photometric calculations to ensure validity of the existing underpass lighting systems in conjunction with the installation of LED luminaires.

- A. Photometric Calculations to Validate LED Lighting Retrofits- 8 hours
- B. Preparation of LED retrofit plans- 48 hours
- C. Preparation of Special Provisions- 8 hours
- D. Preparation of Summary of Quantities- 4 hours
- E. Preparation of Estimate of Cost- 4 hours

**8. PREPARATION OF FINAL PS&E FOR LED LIGHTING RETROFIT AT PULASKI DRIVE OVER US HIGHWAY 41- 28 Hours**

EJM will prepare PS&E plans for the replacement of existing HPS roadway luminaires with LED luminaires at Pulaski Drive over US highway 41. EJM scope of work will also include lighting photometric calculations to ensure validity of the existing roadway lighting systems in conjunction with the installation of LED luminaires.

- A. Photometric Calculations to Validate LED Lighting Retrofits- 4 hours
- B. Preparation of LED retrofit plans- 16 hours
- C. Preparation of Special Provisions- 4 hours
- D. Preparation of Summary of Quantities- 2 hours
- E. Preparation of Estimate of Cost- 2 hours

**9. QA/QC – 40 hours**

**10. ADMINISTRATION – 8 hours**

**General Items**

- 1. Plan sets and Special Provisions to be prepared in English units.
- 2. Lighting detail sheets will not be prepared to scale in order to properly illustrate installation details.



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3. All electrical design will be in accordance with The National Electric Code (NEC), the National Electrical Safety Code (NESC) and any other applicable State or Local Electrical codes.