1.0 Site Access

Design-Build Entity shall conform to all District rules and requirements for accessing sites, including all provisions of Education Code section 45125.1. Road usage, road closures, number of vehicles, access points, etc., may be regulated by the District. Site visits shall be approved and proper check-in requirements with the designated District contact person must be followed. During the Construction period, contractors personnel will need to check-in with both the designated District contact person and the District Police Department.

2.0 Project Management

2.1 PROJECT MANAGER

Design-Build Entity shall assign a Project Manager from their firm upon execution of the Agreement and receipt of Notice to Proceed. The Project Manager shall manage all design, procurement, construction, and commissioning phases of the Project. The Design-Build Entity is wholly responsible for the construction of all lighting components, controls and luminaires with an on-site construction management team. The Project Manager shall ensure that all contract, schedule, and reporting requirements of the Project are met and shall be the primary point of contact for the District.

2.2 PROJECT SCHEDULE

A Project Schedule is to be prepared and submitted to the District within 14 days of Agreement execution. The District will review and approve the Project Schedule prior to the initiation of work. Updates shall be submitted every other week, though the District may allow less frequent updates at their discretion. The submittal shall be a Critical Path Method (CPM) Gantt Chart schedule describing all Project activities, dependencies, and sequencing of tasks. In particular, Design-Build Entity shall include District review of submittals on the Critical Path. The Project Schedule shall describe all elements of
project design, equipment procurement, construction and commissioning, and shall be submitted in electronic format (MS Project). Adobe Acrobat is not acceptable. The schedule shall also reflect the requirement that construction activities must be coordinated to minimize impacts on normal operations at each site, including ongoing construction activities.

Sufficient information shall be shown on the Project Schedule to enable proper control and monitoring of the Work. The Project Schedule shall show the intended time for starting and completing each activity; the duration of each activity; submittal and approval times; design; delivery of materials, equipment and software; all testing; and other significant items related to the progress of the Work. The Project Schedule shall include a CPM network diagram of sufficient detail to show how Mandatory Milestones are intended to be met. If a schedule submitted by Design-Build Entity includes changes affecting the achievement of Mandatory Milestones, Design-Build Entity should clearly identify and justify those changes.

Design-Build Entity is encouraged to phase the Work in a way that supports efficient and effective delivery of design and build services, with limited disruption to typical campus operations. The following Mandatory Milestones shall be reflected in the schedule and where applicable, represents the dates upon which each milestone is to be achieved for all sites in the Agreement.

<table>
<thead>
<tr>
<th>Mandatory Milestone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement Executed, Purchase Order Issued (anticipated)</td>
<td>September 18, 2017</td>
</tr>
<tr>
<td>Construction Documents Completed – All Sites</td>
<td>TBD</td>
</tr>
<tr>
<td>DSA Application Approved (if applicable)</td>
<td>TBD</td>
</tr>
<tr>
<td>Substantial Completion – All Sites</td>
<td>TBD</td>
</tr>
<tr>
<td>Final Completion, within 6 months after Purchase Order Issuance – All Sites</td>
<td>30 days after Substantial Completion</td>
</tr>
</tbody>
</table>

2.3 Expected Life of LED Fixtures/Lamps

Provide information regarding the expected life of the proposed fixtures/lamps. Provide support documentation from the manufacturers regarding testing and expected performance, degradation, etc..

3.0 General Provisions

This exhibit supplements other Contract Documents in defining the scope of work of the Design-Build Entity.

The Work shall include all design work, labor, material, tools, equipment, testing, inspection, commissioning and all necessary general conditions, that may be reasonably inferred from the Contract Documents to provide all Design Work and Construction Work to:

Evaluate and modify portions of the exterior lighting as described in Appendix C and section 4, at the five (5) College/District locations, while maintaining high light quality and acceptable light levels. Measures may include, but are not limited to, lamp and ballast replacement; fixture replacement; and occupancy, daylighting and other control strategies.
3.1 ENERGY ANALYSIS REQUIREMENTS

3.1.1 Design Professional shall design in accordance with Energy Analysis Requirements and shall prepare an energy analysis of the Project. Design Professional shall submit specific certification to college as required by California Code of Regulations, Title 24, Part 6, California Energy Code.

3.2 APPLICABLE CODES, RULES, REGULATIONS, REGULATORY AGENCY APPROVALS, & INDEPENDENT REVIEW(S)

3.2.1 It is the Design-Build Entity’s and its Design Professional’s responsibility to design the Project in compliance with applicable requirements of federal and state laws, codes, rules, regulations, ordinances, and standards, including, but not limited to, those outlined below. Design Professional shall have copies available of applicable codes and regulations for ready reference.

a. California Building Standards Code, Title 24 2013, California Code of Regulations (CCR):
   Part 1, Building Standards Administrative Code
   Part 2, California Building Code
   Part 3, California Electrical Code
   Part 4, California Mechanical Code
   Part 5, California Plumbing Code
   Part 6, California Energy Code
   Part 7, California Elevator Safety Construction Code
   Part 8, California Historical Building Code
   Part 9, California Fire Code
   Part 12, California Reference Standards Code

b. General: Reference standards and guidelines include but are not limited to the latest adopted editions from:
   i. 1. ADA Americans with Disabilities Act
   ii. ANSI American National Standards Institute
   iii. APWA American Public Works Association
   iv. ASCE American Society of Civil Engineers
   v. ASHRAE Guideline, the Commissioning Process
   vi. IEEE Institute of Electrical and Electronics Engineers
   vii. IESNA Illuminating Engineering Society of North America
   viii. ISO International Organization for Standardization
   ix. NEC National Electric Code
   x. NEMA National Electrical Manufacturers Association
   xi. NFPA National Fire Protection Association
   xii. OSHA Occupational Safety and Health Administration
   xiii. UL Underwriters Laboratories Inc.
4.0 SCOPE OF WORK

4.1 SUMMARY

Exterior LED Lighting Upgrades cover lighting at campus walkways, pathways, common areas and other exterior locations at Lake County Campus, Colusa County Center, and Sutter Campus. Generally these locations will include exterior wall pack, pole mounted lighting, bollards and in-ground lighting distributed throughout the three campuses. Refer to the following documents which are part of Appendix “C: of the Request for Proposal, RFP 17-01:

Year 4, Exterior LED Lighting Upgrades

A. 20170421.Lake County Campus Exterior LED Lighting
   a. Note: If possible, provide an option to increase existing lighting levels within 50’ of buildings by 20%.
B. 20170421.Colusa County Center Exterior LED Lighting
C. 20170421.Sutter Campus Parking Lot LED Lighting

Year 5, Exterior LED Lighting and Interior LED Lighting Upgrades

D. 21070421.Yuba College Building 2100 Parking Lot LED Lighting
E. 21070503.Woodland CC Interior Building 600 Fluorescent to LED Lighting
F. 21070503.Yuba College Exterior Buildings, Wallpacks and Cans LED Lighting
   a. Note: If possible, provide an option to increase existing lighting levels within 50’ of buildings by 20%.

The information provided in the above attachments are all provided as a starting point for this work. The Contractor/Qualified Vendor is required to do their own independent field assessment work to verify and determine the appropriate and best value approach to the requested work. The information provided may not be 100% accurate in all cases and was generated to provide a starting point only.

Field assessment work done by the Contractor/Qualified Vendor strongly encouraged to inform the proposal with accuracy of the work being an important feature in validating the work and the accuracy of the proposal. The District will not grant the Contractor/Qualified firm Relief due to inaccurate quantities or types of fixtures “after the fact” once the project is awarded. Contractors/Qualified Vendors are required to list all fixtures and lamps used in the preparation of the proposal by location, to demonstrate that the approach used will meet the needs of the District and that they understand the requested work that needs to be done.

A separate spreadsheet is required for each location per the items listed in Year 4 and in Year 5 above.

A separate proposal cost amount is required for each of the six (6) items listed above and the cost added up for each of the three projects in year 4 and year 5 above.

A separate implementation schedule is required for Year 4 and Year 5 per the projects listed above.

This is a fixed price lump-sum type project.
4.2 SURVEY OF EXISTING CONDITIONS

Bid documents require a preliminary design solution for all lighting listed in the documents for the exterior areas. The Design Build Entities are recommended to undertake a non-mandatory site walk at each site to become familiar with the areas addressed in the preliminary survey documents. The Design-Build Entity shall refer to the ‘Existing Fixture Survey’ and ‘Site Lighting Plan’ for each campus for information on the location, fixture type, lamp, wattage of existing fixtures. The proposed design shall include assessments of all existing survey documents in order to understand their condition and their implications for system design, construction and operation.

The Design-Build Entity shall utilize AutoCAD electronic files whenever they are available to represent the layout of the building and/or the construction of the existing lighting systems. Where AutoCAD drawings of the existing lighting system are not available, the Design-Build Entity shall use scanned drawings. Where building plans are not available, the Design-Build Entity shall use site plans to display the layout of the existing lighting.

4.3 RETROFIT/ REPLACEMENT REQUIREMENTS

The Design-Build Entity shall propose design solutions to improve the lighting and control for each lighting zone. The Design-Build Entity may propose either retrofit, such as installation of new lamps and ballast in existing housing, or replacement, for each Entry listed on the ‘Existing Fixture Survey’. The ‘Existing Fixture Surveys’ may note additional guidelines that dictate which type of fixtures, controls or retrofits can be proposed in specific applications. It is recommended to replace lighting in the existing location to utilize the existing circuits. Provide universal voltage for initial design, fixtures are to be field verified by the Design-Build Entity for circuiting and voltage once contract is awarded.

Retrofit and/or replacement fixtures shall meet the District’s desired aesthetic for each campus. Uniformity in luminaire’s appearance, performance, and control capability shall be considered by the Design-Build Entity and approved by the District.

The Design-Build Entity shall evaluate occupancy and/or vacancy sensor controls using the reduced loads that would exist after the new fixture or lamps and ballast products have been implemented.

The Design-Build Entity shall describe their proposed modifications for each lighting zone. This includes an identification of the proposed ballasts, lamps, fixtures, retrofit kits and controls. When the project includes a change in the total number of fixtures, schematic drawings showing each proposed new and removed fixture shall be included for District review.

Table of Standard Fixture Wattages For fixtures with two lighting levels provide the power and light level information for both levels. For fixtures with dimming capability, provide the power and light level information at 100%, 50% and minimum light levels. State the specific minimum light levels achieved by the luminaire.

The Design-Build Entity shall provide a count of each of the proposed luminaires, the total power draw for the luminaires in each zone, and the proposed installed lighting power density (W/square foot) in each Lighting Zone.

The Design Build Entity shall summarize proposed fixtures and energy usage using the provided template in the “Summary of Proposed Fixtures and Wattages” workbook and submit a qualitative description of their controls system/approach. The information will be used by the District to run energy calculations and compare bids.
For each campus, provide the following information:
- Proposed fixture description
- Proposed fixture quantity
- Proposed Lamps/fixture
- Proposed Nominal Fixture Wattage (W)
- Proposed Actual Fixture Wattage (kW)

The Design Build entity shall be responsible for proper disposal of removed or replaced lighting components. The Design-Build Entity shall include the decommissioning, removal and proper disposal of existing lighting control panels and associated equipment in their design.

5.0 Design and Design Review

5.1 GENERAL

5.1.1 Upon the District’s written Notice to Proceed, Design Professional shall review their Design Proposal with the District Representative, and make changes to the documents as directed that are typical of final revisions to Schematic Design and do not materially change the scope of the Work. Upon the District’s written approval of the revised Design Proposal, Design Professional shall prepare for approval by District’s Representative, Design Development documents. These documents shall consist of such drawings, Audit Sheets and narratives as are needed to establish and describe the size and character of the entire Project, and allow the District to initiate Scope Compliance Review(s). Design Professional shall incorporate into the Design Development documents electrical (power and lighting) systems, materials, and such other elements and other systems as required for the Work and as described in Contract Documents.

5.1.2 Design Professional shall submit documentation supporting the design criteria for the electrical and lighting systems, and other specialized building systems affected by the Work.

5.1.3 The Work of this phase is subject to independent reviews, both internal and external, and value engineering.

5.1.4 Prior to completing the 100% Design Development phase submittals, Design Professional shall evaluate the programmatic requirements and call to the attention of college’s Representative any discrepancy contained therein and request direction regarding any discrepancies.

5.1.5 The District will not grant the Contractor/Qualified firm Relief due to inaccurate quantities or types of fixtures “after the fact” once the project is awarded.

5.1.6 All information provided by the District regarding quantities and types of fixtures is provided as a starting point and may not be 100% accurate regarding quantities, types, and styles of fixtures. This information is provided as a starting point only and is strongly recommended to be field verified.

5.1.7 Maximum value to the District will be used as a factor in evaluating the proposals. Provide information that demonstrates maximum value in the form of lower cost of ownership, life, performance, reliability, spare parts availability, aesthetics, features, proven technology, etc.. All fixtures and lamps are strongly recommended to be sourced from products listed on the PG&E rebates and incentives lists.
5.2 ELECTRICAL REQUIREMENTS

The power layouts shall be shown on one set of drawings, and the lighting layouts shall be shown on a different set of drawings. Use standard symbol conventions.

5.2.1 Floor Plans
   a. Scale: Not less than 1/8 inch = 1 foot 0 inches
   b. Indicate the location of each load center unit substation, distribution switchboard, panel board for power and lighting.
   c. Indicate the types and locations of lighting fixtures and controls and use a schedule for detail.

5.2.2 Large-Scale Drawings
   a. Scale: Not less than ¼ inch = 1 foot 0 inches.
   b. Provide a layout of all equipment rooms and closets to ensure the proposed equipment with proper clearances will fit in the allotted space.

5.2.3 Schedules
   a. Provide schedules for light fixtures, lamp types, ballasts, watts, controls and retrofit kits.
   b. Provide panel schedules.

5.3 DESIGN SUBMITTALS

The Design-Build Entity shall prepare a comprehensive submittal package for each phase of the Work that will be reviewed and approved by the District. Each submittal package shall include, at a minimum, the required elements that convey in sufficient detail for each phase of the design, the necessary documentation as follows:

- Site Layout Drawings
- Illuminance Calculations
- Energy Savings Calculations
- Construction Specifications (trenching, mounting, etc.)
- Equipment Layout Drawings
- Detailed Drawings
- Single-Line Diagrams
- IT Network Connection Diagrams
- Control System Architecture
- Structural Drawings
- Manufacturer’s Cut Sheets
- Equipment Specifications
- Installation Details and/or Directions
- Graphical representation of grouping/zoning of fixtures
Design-Build Entity shall include adequate time for District review and approval of submittals, as well as re-submittals and re-reviews. Minimum District review time shall be ten (10) days from the date of receipt of each submittal package during each phase of the Design Review.

5.4 DIVISION OF THE STATE ARCHITECT (DSA) REVIEW

Construction Documents must be reviewed and approved where applicable by the Division of the State Architect (DSA). For poles less than 35 feet tall (lighting poles, flag poles, etc.), Design-Build Entity may utilize IR A-22 line item #3 DSA review exemption. The District will not grant Design-Build Entity relief based on Design-Build Entity’s incomplete or incorrect understanding of DSA requirements.

6.0 Construction

6.1 GENERAL

The Design-Build Entity shall provide all materials, equipment, labor, and services required by the Contract Documents to construct the Work for the Contract Sum and within the Contract Time during the Construction Phase.

6.2 TESTING AND INSPECTION

Testing and inspection shall follow the approved Quality Control Plan and the Specifications.

6.2.1 The Design-Build Entity shall:

a. Participate in punch list inspections for beneficial occupancy, substantial completion and final completion. Punch lists shall be prepared by the designer on the project to confirm code and design compliance.

b. Assist District’s Representative in reviewing test and inspection results.

c. Not authorize deviations from the Contract Documents.

d. Assure the Construction Work is in compliance with the Quality Control Plan and Specifications.

6.3 RECORD DOCUMENTS

6.3.1 Any revisions or changes that have been made during construction shall be incorporated in the Record Documents. During construction, college’s Representative shall have reviewed all revisions and changes and shall have approved the set of drawings and specifications maintained by Design-Build Entity prior to Design Professional’s preparation of the final Record Documents. Design Professional shall provide reproducible Record Documents to the District in all the following formats: (1) hardcopy and (1) electronic copy in pdf, Excel & Word (for Specifications) and AutoCAD formats.

6.3.2 Electrical drawings shall include the following items:

a. The final control sequence for each lighting system, if modified.

b. Revisions of each schedule in the original Contract Documents reflecting the actual equipment installed (by manufacturer's name and model number) and all other revisions.

6.4 GUARANTEE TO REPAIR PERIOD INSPECTIONS

Design-Build Entity shall review the work no later than 11 months after Substantial Completion, or Final Completion, as applicable and shall submit written recommendations to the District for the correction of any deficiencies. Design-Build Entity shall be accompanied by District and Design...
Professional(s) during these inspections. Dates for inspections shall be as mutually agreed by the parties.

6.5 QUALITY INSURANCE AND QUALITY CONTROL

1. Design-Build Entity shall implement a Quality Assurance / Quality Control (QA/QC) plan for construction activities on District sites. At least 30 days prior to the planned commencement of construction, Design-Build Entity shall submit a copy of the QA/QC Plan for review and approval by the District.

2. To ensure the highest quality of the installation, Design-Build Entity shall:
   
a. Implement policies and procedures to ensure proper oversight of construction work, verification of adherence to construction documents and contractual requirements, and rapid identification and mitigation of issues and risks.
   
b. Utilize best practice methods for communicating progress, performing work according to the approved Project schedule, and completing the Project on-time.
   
c. Keep the Site clean and orderly throughout the duration of construction. All trash and rubbish shall be disposed of off-site by licensed waste disposal companies and in accordance with applicable Law.
   
d. Provide equipment marking, as well as labeling and signage for the Project that shall be removed after Project completion.
   
e. Fully comply with all applicable notification, safety and Work rules (including District safety standards) when working on or near District facilities.
   
f. Route all electrical collection system wiring and conduits in a neat and orderly fashion and in accordance with all applicable code requirements. All cable terminations, excluding module-to-module and module-to-cable harness connections, shall be permanently labeled.
   
g. Provide all temporary road and warning signs, flagmen or equipment as required to safely execute the Work. Street sweeping services shall also be provided as required to keep any dirt, soil, mud, etc. off of roads.

7.0 TRAINING

7.1 The Design-Build Entity shall provide eleven (11) hours (4 hours at Yuba College, 2 hours at Sutter Campus, 2 hours at Woodland Community College Campus, 2 hours at Lake County Campus, and 1 hour at Colusa County Center) of on-site training for District personnel in all aspects of operation, routine maintenance, and safety of the lighting systems. At a minimum, training topics shall include the following:

   a. System safety, including shut-down procedures
   
b. Fixture maintenance, repair and troubleshooting
   
c. Fixture mounting elements maintenance and repair guidelines
   
d. Calibration and adjustment procedures for the fixture and mounting systems (if any)
   
e. Fixture/lamp replacement
f. Control system hardware, software and any associated interface  

g. How to identify and troubleshoot wireless and wired network issues  

h. Warranty coverages and limitations  

7.2 Design-Build Entity shall submit a proposed Training Plan during the design process for approval and provide all training materials and manuals to support on-site training in advance of scheduled training sessions (see schedule of submittals in Section 2.2.3, “Submittals”). The on-site portion of the training program shall be scheduled to take place at the jobsite at a time agreeable to both the District and Design-Build Entity.

8.0 TECHNICAL REQUIREMENTS  

8.1 STANDARDS  

8.1.1. The design shall support compliance with the ASHRAE/IES 90.1-2010 energy standard, 2012 International Energy Conservation Code (IECC), and California’s Title 24-2013 energy code. Following are the minimum mandatory lighting control requirements for ASHRAE/IES Standard 90.1-2010, the national energy reference standard.

a. Automatically turn OFF all lighting during daylight hours.

b. For all exterior lighting, reduce lighting power by 50% either: 1) between midnight or within one hour of campus closing (whichever is later) and 6:00 AM or campus opening (whichever is earlier), AND 2) after no activity has been detected (e.g., using an occupancy sensor) for no longer than 15 minutes. If activity is detected, lighting power shall return to the 100% power level and remain for the 15 minute period. If possible, lights shall flash at the Lake County Campus and Colusa Center locations, for the 15 minute period until lighting returns to the 50% power level after no further activity is detected (between 11pm and 6am).

c. Ensure that all time switches are able to retain their time setting and programming during a power loss of up to 10 hours.

d. Exemptions to all of the preceding requirements: emergency lighting, lighting required by health or safety law or regulation, decorative gas lighting, and lighting where needed for eye adaptation, safety or security at covered vehicle entrances and exits.

8.1.2 The following are Title 24 code compliance requirements.

All installed outdoor lighting shall:

a. Have Auto-OFF by a photo control or astronomical time switch;

b. Be circuited and controlled to turn off independently from other electrical loads by an automatic scheduling control.

8.1.3 Outdoor luminaires with bottoms ≤ 24’ above ground need:

a. Motion or other controls so when area is unoccupied there’s a 50% power reduction (or dim to a 50% power level), and have Auto On functionality

b. No more than 1,500W lighting controlled together

c. Includes Wall Packs per §130.2(c)5
8.1.4 Excludes:

   a. Pole mounted luminaires w/max power ≤ 75W
   b. Non-pole luminaires w/max power ≤ 30W
   c. Linear lighting with max ≤ 4W/ft

8.2 SITE LIGHTING SYSTEM PERFORMANCE

8.2.1 Energy Conservation

   a. Lighting within the parking lot (excluding dedicated emergency lighting) shall
      not exceed a maximum of 0.18 W/ft. Assume 4100 operating hours per year. Both parking lot and
      other area system performance should aim to produce the highest energy savings within the
      given requirements

8.2.2 Lighting Requirements

   a. Lighting levels shall follow and comply with the recommended levels indicated within the current
      IESNA lighting handbook.

Below are the recommended lighting levels values for the relevant areas of the campuses.

<table>
<thead>
<tr>
<th>Application Area</th>
<th>Horizontal Illuminance (fc)</th>
<th>Uniformity ratio (maximum to minimum)</th>
<th>Vertical Illuminance (fc) *</th>
<th>Luminance (cd/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Lot Basic</td>
<td>0.2 Minimum</td>
<td>20:1</td>
<td>0.1 minimum</td>
<td></td>
</tr>
<tr>
<td>Parking Lot Enhanced</td>
<td>0.5 minimum</td>
<td>15:1</td>
<td>0.25 minimum</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadways</td>
<td>0.4</td>
<td>6</td>
<td>N/A</td>
<td>0.4 on grade</td>
</tr>
<tr>
<td>Pathways</td>
<td>0.5 average</td>
<td>N/A</td>
<td>0.5 average</td>
<td></td>
</tr>
</tbody>
</table>

* Measured at height of observer 1.5m, 5 feet

8.2.3 Color Rendering and Color Temperature

   a. Selected fixtures shall have a color rendering of greater than 80 CRI and a color temperature
      between 4000-5000K. The voltage of the new luminaires shall be verified on site with the existing
      circuits available before ordering. All selected fixtures shall be approved and accepted by the
      District and be eligible for the PG&E incentives.
8.3 PHOTOMETRICS

8.3.1 Calculations

a. The lighting calculations shall include a KEY to the proposed lighting that provides the following information: Type and number of luminaire equipment (fixtures), including the "cut off characteristics", indicating manufacturer and model number(s).
b. Lamp source type (bulb type, i.e. LED required), lumen output, and wattage.
c. Mounting height with distance noted to the nearest property line for each luminaire.
d. Types of timing devices used to control the hours set for illumination, as well as the proposed hours when each fixture will be operated.
e. Total Lumens for each fixture, and total square footage of areas to be illuminated. For projects that are in commercial zones, the lumens per net acre to be lit, need not exceed 25,000 lumens. For projects in residential or LBO zones: 10,000 lumens.
f. For all plans of more than three fixtures: A Calculation Summary shall indicate footcandle levels on the lighting plan, noting the maximum, average and minimum, as well as the uniformity ratio of maximum to minimum, and average to minimum levels.

8.3.2 Lighting manufacturer-supplied specifications ("cut sheets") that include photographs of the fixtures, indicating the certified "cut off characteristics" of the fixture shall be provided.

8.3.3 Photometric layouts shall be provided, plotting the light levels in footcandles on the ground, at the designated mounting heights for the proposed fixtures. Maximum illuminance levels should be expressed in foot candle measurements on a grid of the site showing footcandle readings in every five or ten-foot square. The grid shall include light contributions from all sources (i.e. pole mounted, wall mounted, sign, and street lights.) Show footcandle renderings five feet beyond the property lines, or, on developed land areas within 50 feet of project affected area. For example, at Lake County Campus, extend the

8.4 LIGHTING CONTROLS

8.4.1 The proposed lighting control system shall integrate into the existing BMS infrastructure located at each campus. This includes connection and compatibility to the existing BMS systems. The proposed lighting control system shall integrate with the BMS via BACNET/IP connection. Lighting control shall utilize automatic scheduling control by use of astronomical timer or photocell. The new system shall utilize a wireless mesh system to connect a group of fixtures to the nearest control panel. The system shall operate within the 2400-2493.5MHz range and have a wireless range up to 150 feet radius. Signal connectors shall be standard RJ45.

Note: Conduct a field verification inspection of the existing lighting control systems and utilize the existing lighting control systems for all control of all new LED light fixtures.

Generally speaking, the following guidance is provided:

8.4.2 Minimum capability of lighting control system via BMS

8.4.2.1 All Campus/District Locations

Provide a new mesh network control system to replaced and retrofitted luminaires. Provide a BACNET/IP connection to the existing BMS system. Provide the following user control and fixture modes;
A. The systems override shall provide the user with an option to override all logical groups with one command from the BMS. Logical Groups are user selectable lists of fixtures grouped by their use. The groups shall be defined in the lighting control system. The default occupancy schedule shall reside in the BMS and be adjustable for each campus separately.

B. The user shall be able to modify occupied and security status for all new fixtures globally within the lighting control system without having to modify them for each fixture. The light level setpoints can reside anywhere in the lighting control system but have to be globally adjustable by the user without having to adjust the level for each fixture separately.

**Fixture Modes:**

- **Fixture OFF** / **Fixture ON** / **Fixture Occupancy Mode** / **Fixture Security Mode**

The modes Fixture OFF and Fixture ON are user selected conditions and only active if the user overrides the Automatic Mode. Manual states of any group shall be reported daily in a status log if the zone is in manual mode after the occupancy mode ends each day. There are two different light setpoints for occupancy and security mode.

- **Fixture Occupancy Mode** is defined as the time between sunset and sunrise when the school is considered in operation. The default school operational schedule shall be to 6AM and 11:00PM Monday Thru Sunday, seven days per week. Due to the risk of vandalism and since Custodians work during the night hours, even on some weekend nights, the exterior lighting schedule will be the same, 7 days per week. The Sunrise time shall be determined by an astronomical clock calculating the time-based on the location of the campus.

- **Fixture Security Mode** is defined as the time between sunset and sunrise when the school is considered non operations and the astronomical clock indicates Night condition.

- **Fixture Offline Mode** is defined as whenever any of the fixtures is no longer reporting on the network. The fixtures shall operate based on their own sensors whenever they lose communication and automatically return to normal mode once they communicate again. The specific function and profile for the off-line mode shall be user selectable and be globally changeable at the user interface.

8.4.3 All outdoor lighting installed below 24 feet must have an integral motion sensor as per Title 24 2013 code requirements, exceptions are pole mounted luminaires <= 75W, non pole mounted luminaires < 30W and linear lighting < 4W per foot. The motion sensor must reduce the light level during unoccupied periods between 50%. This can be achieved by means of dimming or other power reduction methods. Lighting shall be zoned per use and no more than 1,500 watts of lighting shall be controlled together.

8.5 **LUMINAIRE WARRANTY**

8.5.1 All warranties shall be based from the date of District acceptance of the fixtures.

a. Provide a comprehensive written 5-year warranty for including luminaire finish, onsite replacement of material, and workmanship. On-site replacement includes transportation, removal, and installation of new products. Finish warranty shall include warranty against failure or substantial deterioration such as blistering, cracking, peeling, chalking, or fading.

b. Provide a written 5-year replacement material warranty for defective or non-starting LED source assemblies.

c. Provide a written 5-year replacement material warranty on all PSUs.
d. Provide a written 5-year replacement warranty for non-maintained illuminance levels on all light sources (for example, LED package, LED array, or LED module) including, but not limited to the LED die, encapsulate, and phosphor. If the expected useful life of the luminaire system as defined in section 2.4 C is not maintained, then the manufacturer shall replace the light source(s) or luminaire as needed.

e. Provide a written 5-year warranty that LED color shift from initial shall color be less than 0.007 on the CIE 1976 (u’,v’) diagram. This requirement is comparable to a seven-step MacAdam ellipse.

END OF DOCUMENT