Mandarin WRF High Mast Replacement
1411946446 Appendix A - Technical Specifications

JEA Mandarin WRF
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EEI Project No. 2024-031
For

Building Community.

Report Prepared By

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Scope

The purpose of this solicitation for Mandarin WRF High Mast Replacement (this "Solicitation") is to select a supplier to remove and replace high masts located at Mandarin Water Reclamation Facility (WRF) as described in this Solicitation (the "Work") and to determine the best method for JEA to procure the Work with regard to pricing, quality, and workmanship. Current high masts located at Mandarin WRF are the originals installed in 1994. Mast are 30 years old and no longer meet current Building Code. Masts need to be replaced to incorporate safer operation and meet current CAT wind requirements in latest Florida Building Codes. The supplier shall remove the five (5) exiting high masts and their foundations, disconnect the circuits from the existing high mast poles, and modify the wiring thru the new ground boxes to the new 70’ poles as follows:

1. Pole #1 MCC1-P126 Influent Pump Station
2. Pole #2 MCC2-P226 Blower & Power Generating Building
3. Pole #3 MCC7-P701 Internal Recycle Pump Station
4. Pole #4 MCC4-P415 RAS/WAS Pump Station
5. Pole #5 MCC4-P416 RAS/WAS Pump Station

The basis of design is 5, 70’ Carolina High Masts (CHM) with 7, Type V, CHM CLED2-12C (86,000 Lumen, 4,000K) fixtures per pole.

- 70’ lowering device for (5) high mast luminaires. Top latching, external drive lowering device per Florida Department of Transportation (FDOT) specification. Includes mounting positions for high mast fixtures, class 1.
- 2, external drive portable power unit heavy duty with step down transformer
- Anchor bolts with template.
- 6 Spare fixture drivers
- Coordinate with relevant stakeholders to ensure compliance with JEA safety regulations, and standards.
- Provide a foundation design stamped by registered civil professional engineer.
- The pole shall meet or exceed a 135 Mph design per the Florida Building Code Section 1609, Figure 11.
- Alternate products must be approved by the JEA project manager for acceptability.
- Cure the new 4’6”Dx15’D foundation a minimum of 28 days before use.
- Maintain the existing lighting while working on the new foundations.
- Provide temporary lighting upon request by the JEA project manager while transitioning from the old poles to the new poles
- Employ ground penetrating radar and /or soft digs to ensure the new pole foundation does not impact any existing electrical or water or sewer infrastructure.

- At each visit, the Company must immediately notify JEA Security at (904) 665-8200 to report any security breaches or suspicious persons, vehicles, or any other unusual activities and follow up with the Facilities Contract administrator.
- The Company must be responsible for the daily securing and clean-up of its equipment at the facility, after all work has been completed.
- Job sites are to be kept clean at all times. Contractor will supply his own cleaning products. In field environments, areas will be kept broom-clean.
- The Company shall submit a list of subcontractors with the proposal submission for approval.
- At the start of the contract, the Company must provide the JEA Contract Administrator with a single phone number where service management personnel can be contacted by JEA.
- The Company must supervise and direct the work efficiently and with its best skill and attention. The Company will solely be responsible for the means, methods, techniques, procedures and for the supervision of its employees and subcontractors while performing work under this contract.
- Respondent shall be approved as JEA Safety Qualified before beginning work. Company will verify all Subcontractors are JEA Safety Qualified prior to start of work and review Contractor Safety at JEA.com Contractor Safety | Procurement | About | JEA. Reference Materials. For additional information, contact JEA Safety and Health Services at safety@jea.com.
- Working Hours will be performed during regular work hours (7:00am – 5:00pm, Monday – Friday) and non – Holiday's or weekends.
- Submittals will be reviewed by JEA. The JEA Contract Administrator shall approve all parts and products prior to use by the Company. Any parts and materails ordered for JEA work must be new, unless refurbished is specifically called for by JEA. New items or refubished items must meet or exceed quality, and carry a manufacturer's or remanufacturer's warranty.

SECTION 017839 - PROJECT RECORD DOCUMENTS

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

1.2 SUBMITTALS

A. Record Drawings:

1. One set of marked-up Record Prints.

2. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

B. Record Specifications: One copy.

1. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

C. Record Product Data: One copy.

1. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1.3 PRODUCTS

A. Record Prints: Blue- or black-line white prints of Contract Documents and Shop Drawings, marked to show actual installation.

END OF SECTION 017839

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

1.4 SUMMARY

A. Demolition and removal of five, 70’ high mast; 25, high pressure sodium (HPS), 1,000W, luminaires & lamps; and their concrete foundations.

B. No items will be removed or salvaged for Owner.

1.5 PROJECT CONDITIONS

A. The demolition areas are out in the open near buildings, tanks, equipment, etc..

B. Hazardous Materials: 25 HPS 1,000W lamps to be encountered.

1. Remediation: By Contractor as part of this Project
2. Landfill or subcontractor records for hazardous wastes.

C. Hazardous Materials: Unknown whether any other hazardous materials will be encountered. If encountered, Owner will remove hazardous materials under a separate contract.

1.6 WARRANTY

A. Existing Warranties: none

1.7 EXECUTION

A. Use site pictures, diagrams, and sketches in the bid package to establish the site conditions for the high mast demolition.

B. Utility Services and Mechanical/Electrical Systems: Maintained to occupied facilities.

1. Shut Off: By Owner.

C. Site Access and Temporary Controls: Minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities

D. Temporary Facilities:

1. Temporary barricades to prevent injury to people.
2. Temporary weather protection.
3. Protection of existing buildings and tanks.
4. Protection of existing equipment.

E. Temporary shoring.

F. Removed and Salvaged Items: Cleaned, crated, stored, and transported to Owner's [**on**] [**off**]-site storage area.

G. Existing Items to Remain: Existing construction protected against damage.

H. Disposal of Demolished Items:

1. Burning: Not permitted.
2. Disposal: Off Owner's property.

1.8 SELECTIVE DEMOLITION SCHEDULE

A. Confirm the schedule with the JEA project manager.

END OF SECTION 024119

SECTION 033053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

1.9 SUMMARY

A. Cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes, for noncritical applications of concrete and for projects using small quantities of concrete.

1.10 QUALITY ASSURANCE

A. Quality Standard: ACI 301.

1.11 MATERIALS

A. Formwork.

B. Steel Reinforcement:

1. Reinforcing Bars: Deformed steel. ASTM A615, Grade 60
2. Welded Wire Reinforcement: Plain steel.

C. Concrete Materials:

1. Portland Cement: ASTM C 150, Type IV.
2. Blended Hydraulic Cement: ASTM C 595
3. Aggregates: Normal weight

D. Vapor Retarder: Polyethylene, 10-mil- (0.25-mm-) thick sheet.

1.12 CONCRETE MIXTURES

A. Normal-Weight Concrete Compressive Strength (28 Days): 4000 psi (27.6 MPa)

B. Mixing: Ready mixed

1.13 INSTALLATION

A. Formed-Surface Finish: Smooth

B. Unformed-Surface Finish: broom.

1.14 FIELD QUALITY CONTROL

A. Testing: By Contractor-engaged agency.

END OF SECTION 033053

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70.

B. Conductor Insulation: Comply with NEMA WC 70 for Types THWN-2.

C. Multiconductor Cable: Comply with NEMA WC 70 for nonmetallic-sheathed cable, with ground wire.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

C. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper - Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN-2.

B. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THWN-2.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

B. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

C. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

F. Wiring at Outlets: Install conductor at each outlet, with at least **6 inches (150 mm)**] of slack.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, inspect the wiring and its connections for compliance with requirements.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

C. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519

SECTION 264113 - LIGHTNING PROTECTION FOR STRUCTURES

1.1 SUMMARY

A. Lightning protection for high mast poles

1.2 QUALITY ASSURANCE

A. Quality Standards: NFPA 780, UL 96, and UL 96A.

1.3 COMPONENTS

A. Poles Mounted Air Terminal(s): Provided by pole supplier.

B. Ground rods.

1.4 INSTALLATION

A. Installation Standards: UL 96A and NFPA 780.

B. Cable Connections: Exothermic.

1.5 FIELD QUALITY CONTROL

A. Inspection: Conforms with UL 96A and NFPA 780

END OF SECTION 264113

SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.5.1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.5.1.3 SUMMARY

A. This Section includes the following:

1.5.1.3.A.1 Exterior luminaires with lamps and ballasts.
1.5.1.3.A.2 Luminaire-mounted photoelectric relays.
1.5.1.3.A.3 Poles and accessories.
1.5.1.3.A.4 Luminaire lowering devices.

1.5.1.4 DEFINITIONS

A. CRI: Color-rendering index.

B. Luminaire: Complete lighting fixture, including driver housing if provided.

C. Pole: Luminaire support structure, including tower used for large area illumination.

1.5.1.5 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4.

B. Live Load: Single load of 500 lbf (2224 N), distributed as stated in AASHTO LTS-4.

C. Ice Load: Load of 3 lbf/sq. ft. (143.6 Pa), applied as stated in AASHTO LTS-4.

D. Wind Load: Pressure of wind on pole and luminaire, calculated and applied as stated in AASHTO LTS-4.

1.5.1.5.D.1 Wind speed for calculating wind load for poles exceeding 50 feet (15 m) in height is 135 mph (177 km/h).

1.5.1.6 SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1.5.1.6.A.1 Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
1.5.1.6.A.2 Details of attaching luminaires and accessories.
1.5.1.6.A.3 Details of installation and construction.
1.5.1.6.A.4 Luminaire materials.
1.5.1.6.A.5 Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
1.5.1.6.A.5.1 For indicated luminaires, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
1.5.1.6.A.6 Drivers, including energy-efficiency data.
1.5.1.6.A.7 LEDs, including life, output, and energy-efficiency data.
1.5.1.6.A.8 Materials, dimensions, and finishes of poles.
1.5.1.6.A.9 Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
1.5.1.6.A.10 Anchor bolts for poles.

B. Shop Drawings:

1.5.1.6.B.1 Anchor-bolt templates keyed to specific poles and certified by manufacturer.
1.5.1.6.B.2 Wiring Diagrams: Power and control wiring.

C. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4 and that load imposed by luminaire has been included in design.

D. Operation and Maintenance Data: For luminaires, poles, and luminaire lowering devices to include in emergency, operation, and maintenance manuals.

1.5.1.7 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with IEEE C2, "National Electrical Safety Code."

C. Comply with NFPA 70.

1.5.1.8 DELIVERY, STORAGE, AND HANDLING

A. Store poles on decay-resistant-treated skids at least 12 inches (300 mm) above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

B. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.5.1.9 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from warranty coverage.

1.5.1.9.A.1 Warranty Period for luminaires: Five years from date of substantial completion.

1.5.1.9.A.2 Warranty Period for metal corrosion: Five years from date of Substantial Completion.

1.5.1.9.A.3 Warranty Period for Poles: Repair or replace lighting poles that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than three years from date of Substantial Completion.

1.5.1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. PE STAMPED FOUNDATION DESIGN
2. (2) - EXTERNAL DRIVE PORTABLE POWER UNIT FOR CHM LOWERING DEVICE STANDARD DUTY WITH STEP DOWN TRANSFORMER
3. (6)- SPARE DRIVERS FOR CLED2.

2 PRODUCTS

2.4.1.1 MANUFACTURERS

B. Manufacturers: As noted on the drawings by notes and/or by the light fixture schedule dictated by this Section. Subject to compliance with requirements, provide products by one following:

1. High Mast Lighting: CHM CLED2 12C or JEA approved equal

2. High Mast Pole: CHM 70' GALVANIZED STEEL HIGH MAST TOWER DESIGNED TO 135 MPH AASHTO LTS-6 NON-FATIGUE | INCLUDES ANCHOR BOLTS AND STEEL TEMPLATES or JEA approved equal
3. Lighting Ring: CHM 70' C422 LOWERING DEVICE FOR (7) HIGH MAST LUMINAIRES | TOP LATCHING,EXTERNAL DRIVE LOWERING DEVICE LIGHNING ROD | GROUNDING CONDUCTOR ARRESTOR or JEA approved equal
4. Street and Roadway Lighting: Lithonia DSX Series

A. In Exterior Lighting Device Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

2.4.1.1.A.1 Basis of Design Product: The design of each item of exterior luminaire and its support is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.4.1.2 LUMINAIRES, GENERAL REQUIREMENTS

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

J. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

1.2 LED LIGHTING FIXTURES

A. Complete LED lighting fixtures for general illumination shall have been tested by IES LM-79 and LM-80 requirements.

B. LED light fixtures shall be fabricated, assembled, and manufactured as a complete fixture unit, including housing, mounting hardware, driver, light boards (light engines), and lens.

C. LED lighting fixtures shall allow for separate replacement of the light boards and driver. In other words, 'throw away' fixtures with non-replaceable components are not permitted.

D. LED lighting fixtures shall be capable of continuous dimming as a standard offering. Dimming range to be from 100% to at least 20% of rated lumen output. Dimming control shall be 0-10VDC.

E. All LED fixture control devices shall be compatible with the type of drivers and dimming requirements of the particular project and coordinated with the lighting fixture submittals prior to ordering.

F. Universal input voltage (120-277 VAC) drivers shall be provided for all LED applications.

G. In-line fusing: On the primary for each luminaire.

1.3 LED DRIVERS

A. Drivers shall operate from a 60Hz input AC voltage from 120V-277V. Unit shall have an input voltage tolerance range of at least +/- 10%.

B. The Total Harmonic Distortion (THD) of the driver input current shall be no more than 20% when operating at nominal input voltage.

C. Drivers shall have a minimum Power Factor (PF) of 0.90.

D. Drivers shall comply with IEEE/ANSI C62.41 Category C2 (medium) for transient voltage protection. This shall include a 10kV rating, and 5kA rating per the standard 8x20us combo wave testing parameters.

E. Drivers shall comply with the requirements of the FCC rules and regulations, Title 47 CFR Part 18, Non-consumer (Class A) for EMI & EMF (conducted and radiated) interference.

F. Fixtures may require additional surge protection apart from what is integral with the LED driver. See Paragraph 2.8 below for more details.

1.4 LED BOARDS

A. Rated minimum life of 60,000 hours minimum per IES LM-70 testing requirements.

B. Provide a TM21 report on LED boards to be used which tests LED life and lumen maintenance per the IES LM-80 standard, and LED light output and efficacy per the IES LM-70 standard.

C. The correlated color temperature (CCT) of the LEDs shall be 4000K unless noted otherwise. The CCT shall be uniform for all LED modules within like luminaire types and luminaires within a given project. The LED CCT measurements shall have a maximum of three standard deviations (3 SDCM, +/-90K) tolerance on the MacAdam Ellipse.

D. Provide LED boards such that any individual LED failure on a section of LED board within the fixture will not result in significant output loss of the overall fixture.

2.4.1.3 POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS

A. Structural Characteristics: Comply with AASHTO LTS-4.

2.4.1.3.A.1 Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in Part 1 "Structural Analysis Criteria for Pole Selection" Article, with a gust factor of 1.3.

B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.

C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

2.4.1.3.C.1 Materials: Shall not cause galvanic action at contact points.

2.4.1.3.C.2 Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication, unless stainless-steel items are indicated.

2.4.1.3.C.3 Anchor-Bolt Template: Plywood or steel.

D. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Division 03 Section "Cast-in-Place Concrete."

2.4.1.4 STEEL POLES

A. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig (317 MPa); 1-piece construction up to 40 feet (12 m) in height with access handhole in pole wall.

2.4.1.4.A.1 Shape: tapered

2.4.1.4.A.2 Mounting Provisions: Butt flange for bolted mounting on foundation

B. Grounding and Bonding Lugs: Welded 1/2-inch (13-mm) threaded lug, complying with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

C. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.

D. Galvanized Finish: After fabrication, hot-dip galvanize complying with ASTM A 123/A 123M.

1.5 EXTERNAL LED DRIVER SURGE PROTECTION DEVICE (SPD)

A. All pole mounted LED light fixtures, and pole mounted outdoor sports lighting LED products shall come equipped with an additional layer of SPD protection. This additional protection shall be in addition to requirements of the surge protection integral to the LED driver itself.

B. The SPD shall be circuited immediately upstream of the LED driver and mounted either within the fixture or immediately adjacent to it in a concealed, protected, and accessible location. Do not void manufacturer warranty or listing requirements when mounting the SPD.

C. The external SPD shall be circuited either in series or parallel with the light fixture circuit as required of the project and Owner needs. In series circuiting shall de-energize the fixture upon SPD failure (indicating a problem) while parallel circuiting shall allow for continued fixture use after SPD failure.

D. The additional SPD shall have a kilo-amp rating in excess of the kilo-amp rating of the fixture it is protecting. Minimum specifications shall meet IEEE/ANSI Category C2 (medium) 10kV, 5kA@ 8/20us standard combo and 6kV, 100kHz ring wave protection.

E. The additional SPD shall have a let-through voltage rating or Voltage Performance Rating (VPR) that limits the voltage to the downstream driver to within the voltage tolerance of the driver. Anticipated maximum clamping voltage (8/20us @ 10kA) as follows: 600V

(120V circuit), 1000V (208-240V circuit), 1500V (277V circuit), and 2500V (480V circuit).

2.4.1.5 LOWERING SYSTEM FOR LUMINAIRES

A. Arrange system to lower luminaire assembly to a servicing position within 36 inches (900 mm) of finished grade in winds up to 30 mph (49 km/h) and to provide for manual plug connection to electrical power in the lowered position for testing.

B. Coordinate with luminaire and pole manufacturers for assembly details, wind-load and vibration analysis, and compatibility of materials for electrolysis-free attachment and connection for luminaire mounting assembly, lowering device, lowering cable, and portable winch.

C. Structural and Mechanical Design: Use a minimum safety factor of 5.0 for static and dynamic loads of load-bearing components, including cable.

D. Luminaire Mounting and Disconnect Arrangement: Multiple ring-mounted luminaires, arranged for lowering and raising as a group.

2.4.1.5.D.1 Electrical cable for normal operating power to luminaires manually disconnects inside pole base, using weatherproof multipin connector, and shall be arranged to move within the pole during lowering and raising of luminaire assembly.

2.4.1.5.D.2 Electrical cable for normal operating power to luminaires automatically disconnects at a weatherproof multipin connector within the pole-top lowering head at the beginning of the lowering cycle and reconnects when luminaire or luminaire assembly is raised to the operating position.

E. Lowering Device: Weatherproof, cast-aluminum housing and multiple mechanical latches. Moving parts of latching assembly shall be located in the portion of the unit that is lowered to the servicing position. Positive latching in the operating position shall be indicated to the operator at the base of the pole by a clear visual signal, or by other means acceptable to Owner or authorities having jurisdiction.

F. Lowering Cable: stainless-steel aircraft cable.

G. Portable Winch: 120 V electric type. .

2.4.1.5.G.1 Winch Power Connection: Cord and plug.

2.4.1.5.G.2 Winch Raise-Lower Control: Remote-control station with [15 feet (5 m)] <Insert length> of cable.

H. Winch Transformer: Portable, totally enclosed, encapsulated, single-phase, dry type. Primary rated at lighting-circuit voltage; secondary rated at 120 V. Permanent, primary

and secondary, twist-locking plug connectors on pigtails shall match pole-base power outlet and winch plug.

2.4.1.6 REQUIREMENTS FOR INDIVIDUAL EXTERIOR LIGHTING DEVICES

A. Exterior Lighting Device Type LED High Mast Luminaire

2.4.1.6.A.1Voltage: 480-V ac.
2.4.1.6.A.2LED: 4,000K, CRI 70, 0.96 lumen Maintenance @50,000 hours
2.4.1.6.A.3IESNA Lateral Distribution Class: V.
2.4.1.6.A.4Photometric Performance of Installed Units: 82,000 lumens,
2.4.1.6.A.5Minimum Luminaire Efficacy Rating: 140 lumens/watt

B. Complete LED lighting fixtures for general illumination shall have been tested by IES LM-79 and LM-80 requirements.

C. LED light fixtures shall be fabricated, assembled, and manufactured as a complete fixture unit, including housing, mounting hardware, driver, light boards (light engines), and lens.

D. LED lighting fixtures shall allow for separate replacement of the light boards and driver. In other words, ‘throw away’ fixtures with non-replaceable components are not permitted.

E. LED lighting fixtures shall be capable of continuous dimming as a standard offering. Dimming range to be from 100% to at least 20% of rated lumen output. Dimming control shall be 0-10VDC.

F. All LED fixture control devices shall be compatible with the type of drivers and dimming requirements of the particular project and coordinated with the lighting fixture submittals prior to ordering.

G. Universal input voltage (347-480 VAC) drivers shall be provided for all LED applications.

H. Internal surge protection in every luminaire

3 EXECUTION

3.4.1.1 LUMINAIRE INSTALLATION

A. Install lamps in each luminaire.

B. Fasten luminaire to indicated structural supports.

C. Adjust luminaires that require field adjustment or aiming.

3.4.1.2 POLE INSTALLATION

A. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features, unless otherwise indicated on Drawings:

3.4.1.2.A.1 Fire Hydrants and Storm Drainage Piping: 60 inches (1520 mm) .
3.4.1.2.A.2 Water, Gas, Electric, Communication, and Sewer Lines: 10 feet (3 m)
3.4.1.2.A.3 Trees: 15 feet (5 m)

B. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Division 03 Section "Cast-in-Place Concrete."

C. Foundation-Mounted Poles: Mount pole with leveling nuts and tighten top nuts to torque level recommended by pole manufacturer.

3.4.1.2.C.1 Use anchor bolts and nuts selected to resist the wind loads defined for the application and approved by manufacturer.
3.4.1.2.C.2 Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3.4.1.2.C.3 Install base covers, unless otherwise indicated.
3.4.1.2.C.4 Use a short piece of 1/2-inch- (13-mm-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

D. Raise and set poles using web fabric slings (not chain or cable).

3.4.1.3 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4.1.4 GROUNDING

A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.4.1.4.A.1 Install grounding electrode for each pole, unless otherwise indicated.
3.4.1.4.A.2 Install grounding conductor pigtail in the base for connecting the pole and luminaires to grounding system.

3.4.1.5 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.4.1.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 265600