SECTION 16450

GROUNDING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. POWER SYSTEM GROUNDING.

1.02 TESTS

A. MEASURE ground grid resistance with earth test megger and install additional ground rods and conductors as required until resistance to ground complies with Code requirements.

PART 2 – PRODUCTS

2.01 POWER SYSTEM GROUNDING

A. GROUND AND BOND service entrance raceways, cabinets, equipment, feeder raceways and feeder or distribution panels or switchboards.

B. GROUND AND BOND other metallic raceways, cabinets, motors, and equipment required by NEC.

C. GROUNDING ELECTRODES shall be as required by NEC and as indicated on the Drawings. Provide a made electrode in the form of one or more sectional type copper weld ground rods of 3/4 inch minimum diameter of 10'–0" connected in parallel as to provide a maximum total ground resistance of 12.5 ohms. Connections to ground rods shall be made with Cadweld or equivalent and epoxy coated.

D. BONDING/GROUNDING ATTACHMENTS shall be made to conduits by means of phenolic or plastic throat, malleable iron, cadmium plated ground bushings full equal to T & B 3802 series. Grounding locknuts may be used for additional bonding, but will not be acceptable in lieu of ground bushings.

E. GROUNDING/BONDING CONDUCTORS shall be sized as indicated but in no case less than minimum NEC requirements. They shall be of soft annealed copper and shall be stranded when larger than No. 10, unless noted otherwise. They may be bare except where dangerously close to live parts, but where insulated they shall have a green color jacket or finish. When metallic conduit is used as conductor, connections shall be made tight.

F. WHEN PLASTIC CONDUIT IS USED, an extra ground wire shall be provided on each run.

G. LUGS AND FITTINGS: Grounding shall be UL approved solderless.

END OF SECTION

SECTION 16501

LAMPS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. ALL LAMPS IN LIGHTING FIXTURES as scheduled.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. ACCEPTABLE PRODUCTS:

1. Philips of North America.
2. General Electric.
3. Sylvania/Osram

PART 3 – EXECUTION

3.01 INSTALLATION

A. INSTALL lamps in accordance with Manufacturer's instructions.

B. ADJUST light fixtures and lamps for desired lighting effect within the scope of fixture and lamp specified.

END OF SECTION

SECTION 16502

BALLASTS AND ACCESSORIES

PART 1 – GENERAL

1.01 WORK INCLUDED

A. PROVIDE AND INSTALL required ballasts.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. PROVIDE BALLASTS that meet Standards of an Electrical Testing Laboratory and the Certified Ballasts Manufacturers' Association.

PART 2 – PRODUCTS

2.01 THE FOLLOWING MANUFACTURERS MAY FURNISH EQUAL PRODUCTS:

A. Advance
B. Universal
C. Jefferson
D. Osram/Sylvania
E. Motorola

2.02 HIGH INTENSITY DISCHARGE BALLASTS

A. BALLASTS: 120V or 208V, single lamp of the constant wattage high power type.

B. SELECT EXTERIOR BALLASTS for reliable starting to –20 degrees F.

2.03 LAMPS AND BALLASTS shall be perfectly compatible with one another. Both Manufacturers shall attest to this if so requested by Architect.

PART 3 – EXECUTION

3.01 INSTALLATION

A. PROVIDE BALLASTS of compatible design to lamps specified.

B. MOUNT HIGH INTENSITY DISCHARGE BALLASTS on rubber grommets to reduce noise transmission.

END OF SECTION

SECTION 16521

EXTERIOR LIGHTING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS of the Contract, including General and Supplementary Conditions apply to this Section.

1.02 SUMMARY

A. THIS SECTION includes the following:

1. EXTERIOR LUMINAIRES with lamps and ballasts.

B. RELATED SECTIONS include the following:

1. SPECIAL PROVISION SECTION "Lighting Poles and Standards" for poles and other support structures and for requirements of resistance to wind loads.

1.03 SUBMITTALS

A. PRODUCT DATA: For each luminaire, arranged in the order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. PHYSICAL DESCRIPTION of fixture, including dimensions and verification of indicated parameters.
2. LUMINAIRE DIMENSIONS, effective projected area, details of attaching luminaires, accessories, and installation and construction details.
3. LUMINAIRE materials.
4. HIGH–INTENSITY–DISCHARGE ballasts.
5. HIGH–INTENSITY–DISCHARGE lamps.
6. ELECTRICAL and energy–efficiency data for ballasts.

B. SHOP DRAWINGS: Anchor–bolt templates keyed to specific poles and certified by manufacturer.

C. WIRING DIAGRAMS: Power, signal, and control wiring.

D. COORDINATION DRAWINGS: Mounting and connection details, drawn to scale, for exterior luminaires with requirements specified in Special Provision Section "Lighting Poles and Standards."

E. OPERATION AND MAINTENANCE DATA: For luminaires to include in maintenance manuals.

F. WARRANTIES: Special warranties specified in this Section.

1.04 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.

1.05 COORDINATION

A. COORDINATE EXTERIOR LUMINAIRES with mounting and wind load requirements in Special Provision Section "Lighting Poles and Standards."

1.06 WARRANTY

A. SPECIAL WARRANTY: Manufacturer's standard form in which manufacturer agrees to repair or replace luminaires or components of luminaires and lamps that fail in materials or workmanship; corrode; or fade, stain, 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 special warranty coverage.

B. WARRANTY PERIOD for Luminaires: Five years from date of Substantial Completion.

1. WARRANTY PERIOD for Metal Corrosion: Five years from date of Substantial Completion.
2. WARRANTY PERIOD for Color Retention: Five years from date of Substantial Completion.

C. WARRANTY PERIOD for Lamps: Replace lamps and fuses that fail within 12 months from date of Substantial Completion; furnish replacement lamps and fuses that fail within the second 12 months from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 LUMINAIRES, GENERAL

A. COMPLY WITH UL 1572 and listed for installation in wet locations.

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 re–lamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re–lamping 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. REFLECTING SURFACES shall have minimum reflectance as follows, unless otherwise indicated:

1. WHITE SURFACES: 85 percent.
2. SPECULAR SURFACES: 83 percent.
3. DIFFUSING SPECULAR SURFACES: 75 percent.

J. LENSES AND REFRACTOR GASKETS: Use heat and aging–resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

2.02 HIGH–INTENSITY–DISCHARGE LAMP BALLASTS

A. GENERAL: Comply with NEMA C82.4 and UL 1029. Shall include the following features, unless otherwise indicated:

1. TYPE: Constant–wattage autotransformer or regulating high–power–factor type.
2. MINIMUM STARTING TEMPERATURE: Minus 20 deg F for single–lamp ballasts.
3. NORMAL AMBIENT OPERATING TEMPERATURE: 104 deg F.
4. OPEN–CIRCUIT OPERATION will not reduce average life.
5. BALLAST FUSES: One in each ungrounded power supply conductor. Voltage and current ratings as recommended by ballast manufacturer.

2.03 HIGH–INTENSITY–DISCHARGE LAMPS

A. METAL–HALIDE LAMPS: ANSI C78.1372, wattage and burning position as scheduled, CRI 65 (minimum).

PART 2 – PRODUCTS (continued)

2.04 FACTORY FINISHES

A. FACTORY–PAINTED FINISH for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. SURFACE PREPARATION: Clean surfaces to comply with SSPC–SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC–SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC–SP 8, "Pickling."
2. INTERIOR SURFACES: Apply one coat of bituminous paint on interior of pole, or otherwise treat to prevent corrosion.
3. EXTERIOR SURFACES: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high–gloss, high–build polyurethane enamel.

a. COLOR: As selected from manufacturer's standard catalog of colors.
b. COLOR: As selected by Architect from manufacturer's full range.

PART 3 – EXECUTION

3.01 INSTALLATION

A. INSTALL LAMPS in each fixture.

B. LUMINAIRE ATTACHMENT: Fasten to indicated structural supports.

C. ADJUST LUMINAIRES that require field adjustment or aiming.

3.02 CONNECTIONS

A. 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.

END OF SECTION

PRINTS ISSUED

DATE	PURPOSE	NO.
02.01.10	FINAL PLANS	

RIVER CORRIDOR
IMPROVEMNTS PHASE 1C:
WICHITA, KS

LawKingdon Architecture
Engineering · Planning · Interiors · Landscapes

LawKingdon Architecture
345 RIVERVIEW, WICHITA, KS 67203
Phone (316) 268-0230 Fax: (316) 268-0205
©
CONTACT: JEFFREY A. BEST, ASLA

PROJECT NUMBER:
08386

SHEET TITLE:
ELECTRICAL SPECIFICATIONS

SHEET NUMBER:
SE-5
OF SE-5 SHEETS

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