SP- 232030
(New)

SPECIAL PROVISIONS
FOR
ROADWAY LIGHTING AND ELECTRICAL

Cerro Gordo County
STBG-SWAP-4822(647)--SG-17

Effective Date
March 17, 2026

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

232030.01 GENERAL.

A. Summary.
Includes conductor system, conduit system, precast light bases, lighting units, control cabinet, and equipment pad.

B. References.

1. NEC

2. State and Local Electrical Code

3. National Electrical Contractors Association (NECA) - Standards of Installation

4. UL

5. NEMA

C. Submittals

1. Shop Drawings.
- **a.** Luminaires
- **b.** Standards (pole and arm)
- **c.** Control Cabinets
- **d.** Precast Light Base

2. Product Data.
- **a.** Conductors

b. Conduits & Couplings
c. Fuse Holders
d. Splicing Hardware

D. Quality Assurance.

1. Regulatory Requirements
a. Obtain approval of completed system from state or local electrical inspector.
b. Provide all necessary permit and inspection fees.

E. Project Conditions.

1. Repair any damage to finish of new equipment due to shipping or installation.

2. Coordinate with Alliant Energy – (Contact: Ryan Crooks 641.422.1763) for connection to the source.

3. Current Characteristics.
a. 120/240 Volt, A.C.
b. 1 Phase
c. 60 Hertz
d. 3 Wire

F. Sequencing and Scheduling.
1. All items under this special provision shall be installed prior to final street, sidewalk, and boulevard grading and/or restoration.

2. Contract unit prices shall reflect all construction costs. Extra construction costs associated with the installation of items under this special provision after the completion of new street surfaces; curb, boulevard, and sidewalks, shall be considered incidental.

232030.02 MATERIALS.

A. MANUFACTURED UNIT.

1. Lighting Units.
See the details and Lighting Unit Schedule on the plans.

2. Precast Light Base.
See the details and Lighting Unit Schedule on the plans.

3. Control Cabinet.
a. Manufactured weatherproof, NEMA 3R assembly with dimensions, construction, and components as indicated in the “Control Cabinet” detail in the plans.
b. Completed assembly shall bear ‘UL’ label as “suitable for use as service entrance equipment.”
c. Manufacturer: Povolny Specialties Inc.

4. Arc-Flash Hazard Warning Labels:
Provide 4 inch H by 6 inch W vinyl or polyester labels meeting the following:
- White Background
- Orange background behind the WARNING text
- Black text
- Self-adhesive
- Machine printed letters and numbers
- Water-resistant

B. Components

1. Conductors.
- **a.** Standard copper with 600 volt insulation.
- **b.** Insulation: Type XHHW-2 for underground installation in conduit, and for aboveground installation within poles and Control cabinets.
- **c.** Size and type: as shown on drawing

2. Conduit Systems.
- **a.** Nonmetallic Conduit (NMC) and Fittings:
  - Polyvinyl Chloride, Schedule 40, UL Label.
  - Extra heavy wall, rigid.
  - Carlon PVC conduit Plus 40, 90□C or approved equal.
- **b.** High Density Polyethylene (HDPE) and Fittings:
  - Schedule 40, UL Label, Comply with NEMA TC-7.
  - Extruded, nonmetallic, flexible conduit.
  - Carlon HDPE conduit schedule 40 or approved equal.
- **c.** Rigid Metallic Conduit and Fittings: Hot dipped galvanized, UL Label.

3. Splicing Equipment.
- **a.** Insulated splicing blocks
- **b.** Cold temperature rated to -40°C, 1000V
  - Burndy Uni-Tap
  - NSI
  - ILSCO
  - Polaris

C. Accessories.

1. Grounding Equipment.
- **a.** Grounding Conductors: bare copper wire.
- **b.** Ground Rods:
  - 5/8 inch by 8 foot, copper clad, Copperweld, or equal.
  - Exothermically welded to ground wire.
  - Place two ground rods 6 feet apart at metered service location per Utility requirements.

2. Fuses.
- **a.** Fuses: 6 Amp, dual element fuse for luminaires.
- **b.** Fuse Holder:
  - 1 pole Ideal, 30-S1212N
  - Or approved equal from Bussman

232030.03 CONSTRUCTION.

A. Examination.

1. Verify rules and procedures of the energy supplier for connection to the existing system.

2. Verify locations for making connections to existing facilities.

3. Verify location of existing underground facilities prior to installation.

B. Protection.

Protect all existing surface and underground facilities that are scheduled to remain in place.

C. Installation.

1. General.
- **a.** Conform to the contract documents.
- **b.** Install all equipment based on the locations and dimensions shown in the plans unless utility or other conflicts require a new location for proposed lighting equipment.
- **c.** The lighting distribution circuits shall consist of two ungrounded conductors and one grounding conductor.
  - **1)** Two ungrounded conductors shall constitute one 240-volt lighting circuit.
  - **2)** The third conductor shall be used as an equipment ground.

2. Trenching and Backfill.
- **a.** Excavate trenches to a uniform depth 2 feet below the finished grade.
- **b.** Maintain uniform alignment based on dimensions shown in the plans.
- **c.** Conduit shall be placed in a direct line between light foundations, as shown in plans.
- **d.** Multiple conduits shall be placed in same trench where possible.
- **e.** Use excavated trench materials for backfill. Salvage and reinstall existing Class V aggregate base. If existing Class V becomes contaminated, replace at no expense to the Contracting Authority.
- **f.** Remove sod, roots, clod, debris and stones over 1 inch in diameter from the backfill material.
- **g.** Compact backfill material in maximum 12 inch lifts. Finished compacted density for work in street sections shall match that of the density specified for street construction.
- **h.** Dispose of surplus excavated materials on the site as directed by the Engineer.
- **i.** Do not place backfill material on foundations frozen deeper than 3 inches.

3. Lighting Units.
- **a. Luminaires.**
  - **1)** Stainless steel mounting hardware shall be used to mount luminaires, arms, and accessories to poles.
  - **2)** The Contractor shall apply an approved zinc-based anti-seize compound to all mounting hardware prior to assembly.
- **b. Poles.**
  - **1)** Poles shall be installed plumb and level.
  - **2)** Stainless steel mounting hardware shall be used to secure access door and to mount luminaires to pole.
  - **3)** Handhole doors shall be oriented opposite of luminaire arm.
  - **4)** The Contractor shall apply an approved zinc-based anti-seize compound to all mounting hardware prior to assembly.

4. **Precast Light Base.**
- **a.** Furnish and install a precast light base in accordance with the detail in the plan, at the locations indicated in the plan or as directed by the Engineer. Anchor bolt size and circle shall accommodate pole manufacturer’s requirements.
- **b.** Compact backfill material in maximum 12 inch lifts. Finished compacted density for shall match that of the density specified for street construction.

5. Control Cabinet.
- **a.** Install new lighting control cabinet at location indicated on plans
- **b.** The cabinet type shall be as detailed in the contract documents. Cabinet shall be equipped with components as indicated. All materials including, photocell, conduit, fittings, clamps and hardware, and all labor, tools, equipment, incidentals, and coordination necessary to complete the contract work shall be incidental to the cabinet and installed as per details in the plans.

c. Control Cabinet shall include all items incidental to a complete meter socket and service installation.
d. Install on concrete foundation as per detail and location indicated in plan.
e. Provide grounding per Utility requirements.
f. Install conduit stub to a point outside of the control cabinet base to enable the Alliant Energy service connection. Coordinate with energy provider for connection.
g. Alliant Energy to provide service conduit and conductors and make final connection.

6. Equipment Pad.
a. Furnish and install a equipment pad in accordance with the details in the Plan, at the location indicated in the Plan or as directed by the Engineer. The anchor bolt size and pattern shall accommodate the cabinet manufacturer's requirements.
b. Provide a rigid template of the cabinet base including anchor bolt holes and a slot to hold in proper position and height the anchor bolts, ground rod and conduits during the concrete pouring. The template shall not be removed until the concrete has cured.
c. Anchor rods shall be hot dipped galvanized full length and shall be four in quantity for each cabinet. Each anchor rod shall be threaded a minimum of 4 inches and be provided with two hex-head galvanized nuts and one galvanized washer.
d. Maintain 4 inches of clearance from finished boulevard or sidewalk grade to top of foundation. The Contractor shall coordinate foundation installation with the Engineer to ensure proper foundation elevation is maintained.

7. Wiring and Grounding.
a. Type XHHW-2 conductors shall be used for all underground conduit runs. Leave sufficient lengths of branch conductors to allow conductor splices to be extracted from pole base for maintenance.
b. Extend three No. 12 AWG Type XHHW-2 feeder leads to the luminaires from the cables in the pole base.
c. Install single-pole fuse holders for receptacles and two-pole fuse holders for luminaires on feeder leads. Leave 18 inches minimum lengths of feeder conductors to allow fuse holders and conductors to be extracted from pole base for maintenance.
d. Provide a No. 6 AWG bare copper wire connection to ground rods with ample length to allow connection to light standard grounding lug and system ground conductor.
e. Attach grounding conductor to the energy suppliers neutral at the service point.
f. Terminate grounding conductor with a 25 ohm ground at the service points and at the end of each distribution run.
g. Establish 25 ohm ground with driven ground rods.
h. Provide minimum 2 feet of cover over all wiring.
i. Provide two ground rods at the metered service per Utility requirements.

8. Splicing.
a. Splicing shall be performed only within the pole bases and control cabinets. If identified on the plans, splicing may be performed within handholes and must use submersible splicing hardware installed per manufacturer's recommendations.
b. Wire-nuts are not an acceptable method of splicing within pole base.

9. Conductors.
a. Install complete cable in conduit to each lighting unit as specified on the Plan.
b. Do not splice cable between connection points.
c. All conductors shall be color-coded. If multiple lighting circuits are to be installed within the same conduit, unique color codes or tracer colors shall be applied to conductor groups to identify respective circuits. The conductors shall be grouped and clearly labeled in the lighting control cabinet and each pole.
d. Use insulation of greater rating at the connection of two unlike types.

10. Conduit Systems.

a. General.

1) Install conduit in a direct line between lighting units, cabinets, and handholes (unless trees or other obstructions require an alternate location) to a depth of 24 inches; by direct bury method unless otherwise noted.

2) All conduits that are to be placed under parking areas, driveways, streets, medians, and sidewalks that are not scheduled for removal shall be pneuma gophered, directional bored, or another method approved by the Engineer, which will not damage or disturb the integrity of the surface above.

3) Jack or auger conduit under permanent surfaces.

4) Grout all resultant voids from abandoned augering or jacking attempts.

5) Maintain conduit runs on grade to provide definite drain to low points in the system.

6) Temporarily cap conduit ends during construction.

7) Install ground conductor in all conduit.

8) End bells will be required at all conduit terminations in handholes, poles, and control cabinets.

9) Following installation of cables and conductors, seal the open ends of conduit entering cabinets and pole foundations using duct seal compound NRTL classified under general use tapes.

b. Nonmetallic Conduit (PVC).

1) Solvent weld all conduit and fittings in accordance with manufacturer's instructions.

2) Shall be used for all underground conduit installations, in or beneath slabs under roads, sidewalks, parking lots, and driveways unless noted otherwise.

3) End bells/bushings shall be installed on all conduit ends prior to pulling conductors.

c. Nonmetallic Conduit (HDPE).

1) Except for under existing pavements, underground Continuous Type HDPE Conduit shall be placed by trenching, stitching, plowing, or other method approved by the Engineer. Under existing pavements, Continuous Type HDPE Non-Metallic Conduit shall be placed by directional boring.

2) Appropriate couplings shall be used to connect HDPE conduit to PVC conduit if required in underground runs. PVC cement or epoxy shall not be used to bond HDPE conduit to PVC conduit.

11. Electrical Service.

a. The Contractor shall coordinate the installation of Electrical Service, provide power to the control cabinets, and verify the actual work to be done and all associated costs.

b. Proposed source of power are identified in the Plan.

c. Fees for the "Application for Electrical Service" and payment to the Utility Company for providing the electrical service connections shall be the responsibility of the Contractor.

d. The Contractor shall secure approval from the Engineer for any changes to the Electrical Service as reflected in the Plan.

e. No measurement will be made of the various items that constitute Electrical Service, however all such work will be construed to be included as part of the project (the electrical service costs will not be paid for as part of the pay item). The Contractor shall provide the Engineer a copy of the invoice from the power company. Payment will be made for the invoice cost paid to the power company plus 10%. The payment shall be compensation in full for all costs incidental thereto, including, but not limited to providing power to control cabinets, power company fees, Power Utility Company Coordination, notifying the City of ownership details, and all materials and labor necessary to construct the Electrical Service.

12. Labeling of Circuits.

a. Label all conductors in conduit in new control cabinet and handholes indicating the next termination point. For example, in lighting control cabinet, the label would read "TO POLE A12"; in the handhole the label would read "TO LIGHTING CONTROL CABINET" or "TO POLE A11".

b. Provide labels that consist of white vinyl adhesive tape wrapped around the cable or conductors. Hand write the labeling on the vinyl adhesive tape or produce with a label maker. If label marking is handwritten, accomplish the labeling by using a black permanent marker, in such a manner, that the markings are legible to the satisfaction of the Engineer. Labels produced with a label maker shall be suitable for use in wet locations, and this label must wrap around the cable one complete revolution with some overlap.

13. Grounding.
Ground all metallic conduits, supports, cabinets, non-current carrying equipment parts and the neutral conductor in accordance with the National Electrical Code.

14. Rust Inhibitor.
- **a.** A thorough application of an approved rust inhibitor shall be used to grease or otherwise protect the threads of the anchor rod, prior to pouring the concrete foundation to ensure that the concrete does not mold to the threaded portion of the rod.
- **b.** All threaded stainless steel hardware and dissimilar metal, threaded hardware shall be coated with an approved zinc-based anti-seize compound by the Contractor prior to assembly.

D. Field Quality Control.

1. Testing.
- **a.** Test completed system for unwanted grounds.
- **b.** Conduct megohm meter test (at 500 volts D.C.) indicating resistance of each circuit.
- **c.** Allowable Results:
  - Phase Conductor Insulation Resistance: Not less than 100 megohms.
  - Neutral Conductor Insulation Resistance: Not less than 5 megohms.
  - Circuit Insulation Resistance: Not less than 5 megohms.
- **d.** Provide necessary corrections and retest.

2. Demonstration.
Demonstrate proper operation of completed system.

3. Field Service.
- **a.** Provide full instruction and demonstration in the adjustment, operation, and maintenance of all components of the system.
- **b.** Provide instruction and demonstration to the Owner’s employees during regular working hours.

E. Painting.

1. Paint all exposed metal surfaces or areas damaged during construction.

2. Match original paint type and color.

F. As-built Plans and Operations & Maintenance Manual.

1. Contractor shall supply accurate as-built plans of the project to the Engineer. Drawings shall indicate location and setback of conduit, and pole locations within the project measured from a reliable location. Work must be completed under the direct supervision the Engineer.

2. The Contractor shall collect, gather, and assemble into one book the installation details, instructions, schematics of actual equipment and operations directions supplied by the manufacturer with all equipment. Final acceptance of the work will be withheld until such data has been presented complete to the Engineer. The manual shall be available for instruction of operations and maintenance of equipment and systems.

232030.04 METHOD OF MEASUREMENT.

A. Conductor System.

1. Measure by length in feet.
2. Measure each type and size separately.
3. Measure between terminal point centers along the centerline of the conductor.
4. Add 5 feet at each terminal point for connections.

B. Conduit System.

1. Measure by length in feet.
2. Measure each type and diameter separately.
3. Measure between end terminals along the centerline of the conduit.

C. Lighting Units.

Each individual unit will be counted by the Engineer.

D. Precast Light Base.

Each individual unit will be counted by the Engineer.

E. Control Cabinets.

Each individual unit will be counted by the Engineer.

F. Equipment Pad.

Each individual unit will be counted by the Engineer.

232030.05 BASIS OF PAYMENT.

A. System Components.

1. Conductor item includes wire, cable, pulling, splicing, connections, accessories and testing as required to provide a complete installation.
2. Conduit item includes conduit, fittings, fasteners, sealing, accessories, trenching, directional boring methods, backfill, jacking, augering, and restoration as required to provide a complete installation.
3. Lighting Unit item includes LED luminaire, arm, pole, breakaway transformer base, pole accessories, fusing, connections, and accessories as required, to provide a complete and operational unit.
4. Precast Light Base item includes concrete, galvanized anchor bolts, nuts and washers, conduit stubs, reinforcing bars, ground rod and wire with exothermic weld, conduit duct seal, excavation and backfill, restoration and accessories as required to provide a complete unit.
5. Control Cabinet item includes cabinet, circuit breakers, photo control, lighting contactors, selector switches, surge arrestor, wiring, conductors, ground rods with exothermic welds, conduit duct seal, and accessories as required to provide a complete installation.
6. Equipment Pad unit item includes anchor bolts, nuts and washers, conduit stubs, concrete base, concrete form, ground rod, and bonding material, excavation and backfill, restoration and accessories as required to provide a complete unit.

B. Payment for the site electrical system components shall be at the contract unit price as listed on the Bid Form.