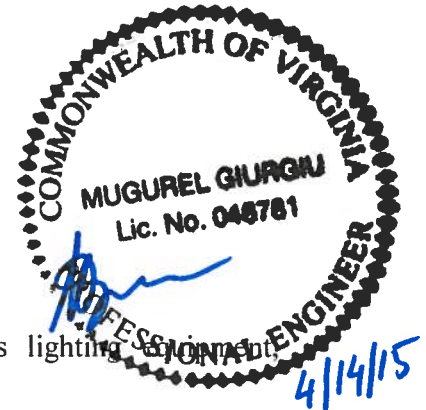


SECTION 26 50 00

LIGHTING



PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for general and emergency egress lighting components, and related installation.

Related Sections:

- | | | |
|----|---------------------|--|
| 1. | Section 26 05 26 | Grounding and Bonding for Electrical Systems |
| 2. | Section 26 05 28 | Hangers and Supports for Electrical Systems |
| 3. | Section 26 05 63 | Acceptance of Electrical Systems |
| 4. | Section 26 05 19 | Low Voltage Electrical Power Conductors and Cables |
| 5. | Section 26 05 33.13 | Conduits for Electrical Systems |
| 6. | Section 26 05 33.23 | Boxes for Electrical Systems |
| 7. | Section 26 27 26 | Wiring Devices |



1.2 REFERENCES

A. Reference Standards:

1. U. S. Government:
 - a. Federal Transit Administration (FTA):
 - 1) 49 CFR 661 Buy America Requirements

B. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

1. ANSI/IEEE C62.41; Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits.

C. Illuminating Society of North America (IESNA)

1. IESNA LM-79, Electrical and Photometric Measurements of Solid-State Lighting Products
2. IESNA LM-80, Approved Method for Measuring Lumen Maintenance of LED Lighting Sources
3. IESNA TM-15, Luminaire Classification System for Outdoor Luminaires.

D. National Electrical Manufacturers Association (NEMA):

1. NEMA 250, Enclosures for Electrical Equipment.
2. NEMA SSL 3, High Power White LED Binning for General Illumination
3. NEMA ST 1 - Standard for Specialty Transformers (Except General Purpose Type)

- E. National Fire Protection Association (NFPA):
 - 1. NFPA 70, National Electrical Code (NEC).
- F. Underwriter's Laboratories, Inc. (UL):
 - 1. UL 1029, Standard for High-Intensity-Discharge Lamp Ballasts.
 - 2. UL 1598, Luminaires.
- G. U. S. Government:
 - 1. Occupational Safety and Health Administration (OSHA):
 - a. 29 CFR 1910 Occupational Health and Safety Standards.
 - b. 29 CFR 1926 Safety and Health Regulations for Construction.
 - 2. Federal Communications Commission (FCC):
 - c. 47 CFR 18 Industrial, Scientific, and Medical Equipment.

1.3 DESIGN REQUIREMENTS

- A. Design Criteria:
 - 1. The Lighting Fixtures described below and indicated on the Contract Drawings constitutes the basis of the lighting design for this Contract, but may not indicate the special design details required.
 - a. The lighting fixtures as described meet the requirements of the lighting design for this Contract with respect to the visible style, light source, and lenses desired.
 - 2. Provide lighting fixtures meeting the requirements of the basis of the lighting design for this Contract, and which have the special details specified in this Section.
 - a. Submit Shop Drawings and manufacturer's installation instructions to show details of assemblies and sub-assemblies, and specially-fabricated supporting and fastening devices.
 - b. Submit bills of material for the fixtures and their appurtenances.
 - 1) Reference the bills of material to the Shop Drawings.
 - 2) Provide bills of material consisting of itemized lists of the parts required (i.e. ballast capacitor igniter, and other similar item descriptions).
 - 3) Identify each part with a part number and/or manufacturer number.
 - c. Provide fixtures for exterior installation that are designed to be completely waterproof.
 - d. Provide luminaire brackets designed to be compatible with configuration of the luminaire.

1.4 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 - 1. Buy America Act :

- a. Except for those products which are exempt under the specific statutory waivers stipulated in 49 CFR 661, all other products supplied under this Section must comply with the requirements of the Buy America Act.
- B. Regulatory Requirements:
- a. The execution of work of this Section must satisfy the applicable requirements of the latest edition of NFPA 70 (NEC), the National Occupational Safety and Health Act as embodied in 29 CFR 1910 and 29 CFR 1926, and regulations of local jurisdictional authorities.
- C. Certifications:
1. All products must be Underwriters' Laboratories (UL) listed; and each fixture, Emergency Battery Unit, and exit sign must bear the UL label.
 - a. The UL standards appropriate for the products specified are listed in Paragraph 1.02.E.
 - b. Alternatively, Listing by an OSHA Nationally Recognized Testing Laboratory (NRTL) to the relevant UL standards is permitted.

1.5 SUBMITTALS

- A. Submit the following information for approval in accordance with the requirements of the Procurement Documents. Refer to Section 00 33 00 SUBMITTAL PROCEDURES:
1. Submit the following information to obtain the Engineer's approval:
 - a. The manufacturer's catalog cuts indicating the type, design, dimensions, mounting arrangement, and other industry standard lighting fixture information.
 - 1) Describe the lighting fixtures and appurtenances.
 - b. Manufacturer's photometric data and electronic ies files.
 - c. Complete photometric data for the fixture, including optical performance, completed by an independent testing laboratory developed according to the standards of the Illuminating Engineering Society of North America as follows:
 - 1) For direct, direct/indirect and indirect lights used for general illumination:
 - a) Coefficients of utilization.
 - b) Candlepower data, presented graphically and numerically, in 5 degree increments (5 degree, 10 degree, 15 degree, etc.). Data developed for up and down quadrants of normal, parallel, and at 22-1/2 degree, 45 degree, 67-1/2 degree planes to lamp(s). If light output is asymmetric, provide additional planes as required to complete report.

- c) Zonal lumens stated numerically in 10 degree increments (5 degree, 15 degree, etc.) as above.
 - d) Average luminaire luminance calculated in the lengthwise, crosswise, and 45 degree vertical planes.
 - d. Point-by-point lighting calculations showing the uniformity of light on the sidewalk levels.
 - 2. Submit a complete light source (HID & LED) inventory for approval, including specific lamp type, manufacturer, and all appropriate lamp criteria including but not limited to: life, initial and mean lumens, beam spread, candlepower, lamp envelope, base type, color temperature, and color rendering index.
 - 3. Quality Assurance/Quality Control Submittals:
 - a. Certificates:
 - 1) Proof that equipment furnished has the required Underwriters' Laboratories (UL) listing.
 - 2) Ballast certifications.
 - b. Manufacturer's Instructions:
 - 1) Manufacturer's installation instructions.

1.6 EXTRA MATERIALS

- A. Maintenance Tools:
 - 1. Provide two each of the special maintenance tools as may be necessary for re-lamping fixtures and for fixture maintenance.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Conduit and Raceway:
 - 1. Provide electrical conduit and raceway in accordance with the requirements of Sections 26 05 33.13 as indicated and as appropriate for the application per NFPA 70.
- B. Fixture Support Devices and Fasteners:
 - 1. In addition to the supporting devices and fasteners specified in Section 26 05 28, provide suspension accessories, canopies, casing, sockets, holders, reflectors, plaster frames, recessing boxes, and similar items required to support the lighting equipment and luminaires as specified or indicated.
- C. Wire and Cable:
 - 1. Provide electrical wire and cable in accordance with the requirements of Section 26 05 19.

2.2 MANUFACTURED UNITS

- A. Light Fixtures:
1. Fixture Grounding Device and Conductor:
 - a. Provide the housing of each fixture with a separate, factory-installed grounding device and ground conductor.
- B. Lamps:
1. Provide the proper type of lamps for the lighting fixtures scheduled on the Contract Drawings or indicated on the approved Shop Drawings.
 - a. Match the voltages of LED and HID lamps to installed fixtures.
 - b. Provide lamps having the proper type of sockets to suit the fixtures provided.
 2. If fluorescent lamps are required, provide the energy saving type unless otherwise indicated on the Contract Drawings.
- C. Fiber-Optic Lighting System
1. Fiber-Optic Illuminator
 - a. Provide a fiber optic illuminator that is a two-part assembly to keep the mild steel boxed housing bulk to a minimum and enable discreet installation within confined spaces of the canopy structure.
 - b. Each housing shall be rated for 5 degrees C above ambient. The lamp housing shall be cooled with a ventilation fan capable of maintaining the lamp housing temperature.
 - c. Provide illuminator with a 150W short-arc single ended Metal Halide lamp complete with internal reflector, housed in its own discrete fanned unit, as is the ballast as specified below, whose unit ventilates through louvers on the lid. Each unit is micro switch-protected.
 - d. 120VAC power shall be connected to the front of the ballast housing, which is then connected to the lamp housing via a interconnecting cable that is sheathed in protective kopex trunking. The cable shall be fitted with an HV IP-rated circular plug connector at each end, to match the sockets set in the lamp and ballast housing boxes. The length of the inter-connecting cable shall be a maximum of 500mm.
 - e. The lamp life, powered through an metal-halide electronic ballast, shall be rated at a minimum of 8000 hours. Either housing may simply be disconnected enabling one unit alone to be freed and removed for servicing.
 - f. The lamp color temperature is 4000 degrees Kelvin. Provide capability for placement of color correction filters into the lamp housing immediately in front of the fiber optic common end bundle that can alter the color temperature.
 - g. Provide a soft re-set thermal cut-out within the body of the ballast itself to afford protection against thermal overload. Internal

components shall be coated with conformal silicone sealant to promote maximum operational longevity.

- h. The passage of coolant air shall be directed so as to ensure premium operating conditions for the lamp and protection for the fiber optic common end bundle. Provide additional protection by use of a UV /IR filter across the fiber bundle common end port and by a hard-reset thermal cut out which acts to extinguish power to the lamp should temperatures within the unit exceed 94 degrees C.
2. Fiber Optic Lighting Fixtures
- a. Fixture Type (FO-O) (All Stations Except Huntington Station)
 - 1) The FO-O fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a ~~13mm~~ glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each stations respective architectural drawing canopy lighting plan. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.
 - 2) The FO-O fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure. ~~Provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.~~
 - 3) FO-O fitting shall be recessed in longitudinal girder, adjusted to outward with optical properties as depicted in Architect's lighting plan, delivering an even minimum/maintained light level of ~~5+0~~ footcandles on perimeter edge beam.
 - b. Fixture Type (FO-I) (All Stations Except Huntington & Dupont North Stations)
 - 1) The FO-I fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a ~~25mm~~ glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each stations respective architectural drawing canopy lighting

- plan. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.
- 2) The FO-I fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.~~Provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.~~
 - 3) FO-I fitting shall be recessed in longitudinal girder, adjusted to opposite girder with optical properties as depicted in Architect's lighting plan, delivering an even minimum/maintained light level of 10 footcandles on the opposite girder.

c. Fixture Type (FO-I) (Dupont North Station Only)

- 1) The FO-I fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each stations respective architectural drawing canopy lighting plan. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.
- 2) The FO-I fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.
- 3) FO-I fitting shall be recessed in main girder, adjusted to primary transverse or longitudinal members with optical properties as depicted in Architect's lighting plan,

delivering an even minimum/maintained light level of 10 footcandles.

d. Fixture Type (FO-S) (Dupont North Station Only)

- 1) The FO-S fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each station's architectural drawing canopy lighting plan to illuminate the text inscription. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.
- 2) The FO-S fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.
- 3) FO-S fitting shall be recessed in longitudinal girder, adjusted to the text inscription with optical properties as depicted in Architect's lighting plan, delivering an even minimum/maintained light level of 10 footcandles on the text inscription.

e. Fixture Type (FO-I) (Huntington Station Only)

- 1) The FO-I fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each stations respective architectural drawing canopy lighting plan. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.
- 2) The FO-I fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties

as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.

- 3) FO-I fitting shall be recessed in longitudinal girder, adjusted to opposite girder with optical properties as depicted in Architect's lighting plan, delivering an even minimum/maintained light level of 7 footcandles on the opposite girder.

f. Fixture Type (FO-U) (Huntington Station Only)

- 1) The FO-U fixtures shall be machined out of aluminum and anodized in natural finish, with beam control being exerted by a glass optical collimating lens and diffusion filters of diameter required to provide the light level indicated below and the beam spread indicated on each stations respective architectural drawing canopy lighting plan. The fiber entry point shall be threaded, and the fixture shall be rotated onto the fiber until it reaches a natural physical 'stop' at which point it has attained optimum focus.

- 2) The FO-U fixture body shall be held in place through the girder aperture by means of a countersunk stainless steel screw threaded into a tapped hole in the steel canopy structure. The fixture shall be wound to the correct position to ensure that the fixture is aimed properly as directed by the Authority. Mechanically attach the fixture to the structure with a stainless steel screw of size and properties as indicated on the Architect's lighting plan. In addition, provide a clear adhesive bonding agent to achieve a water-tight seal between the fixture flange and the side of the steel canopy structure.

- 3) FO-U fitting shall be recessed in strut pedestal, adjusted to provide uplight with optical properties as depicted in Architect's lighting plan, delivering an even minimum/maintained light level of 10 footcandles at the point of focus as depicted in Architect's lighting plan.

3. Refer to architectural drawings for additional product information including but not limited to:
 - a. Maximum dimensions of the lamp/ballast housings for coordination with structural steel members of the canopy.
 - b. Lighting fixture dimensions and photometric performance

D. LED Lighting Fixtures (All Stations Except Huntington Station)

1. Color temperature of any submitted fixture shall be within 10% of the specified value, 3100 degrees K.
2. Provide fixture housing with internal driver, LED board and Spot (18-degree) optical focus lens. Clear tempered, shock resistant glass lens shall

- be adhered to fixture cap to provide a hermetically sealed optical compartment. Provide an additional eight narrow spot optical focus lens (14 degree) per site for site-specific focusing.
3. Lens cap of fixture shall be 90 degree cut off type and provided with lens holder for use of directional linear lens accessory. The lens holder shall be 'fixed' to the correct position (relative to axis of fixture) to ensure that the fixture is aimed properly as directed by the Authority Representative. See Architectural Drawing for specified lens orientation. Directional lens will not be used in every fixture and shall not be 'permanently' attached to holder.
 4. Lighting fixtures shall be constructed of copper-free aluminum, finish and color as specified by the Authority Representative. Fixture housing, lens cap, LED board, optic module and lens accessory to be provided with natural physical 'stop'/locking devices to obtain and ensure optimum light output/focus.
 5. Provide 360 degree rotating knuckle, with locking device and canopy mounting faceplate option of color and finish matching fixture.
 6. Mounting hardware and fixture screws shall be stainless steel.
 7. Power consumption of any submitted fixture shall not exceed the specified value of 8.2 Watts by more than 10%. If a fixture is submitted and approved at an increased wattage within 10% of the specified wattage), any power system modifications necessary to accommodate the fixtures will be the responsibility of the contractor (i.e. increased wire sizes, increased circuit breaker size, additional circuits/breakers, etc.)
 8. LED Lumen Efficacy (Lumens/Watt) of a submitted fixture shall not be less than the specified fixture (30 lumens/watt) by more than 10%. Fixture lumen output shall provide at sidewalk surface an average illumination level of 3FC maintained, 4.3 FC initial as required by WMATA Manual of Design Criteria for Station Entrance Within 30-ft. of the Entrance or Parapet Wall.
 9. Characteristics of submitted fixtures shall have the same features as the specified LED fixtures (i.e. redundant drivers, driver protection, etc.) whether specifically noted on the lighting fixture schedule or not.
 10. LED Light fixtures shall have a minimum expected life of 50,000 hours. The aforementioned life rating must be conducted with a 40 degrees Celsius ambient temperature.
 11. Operational Performance: the LED circuitry shall prevent visible flicker.
 12. Thermal Management: The thermal management (of the heat generated by the LED's) shall be of sufficient capacity to assure the proper operation of the luminaire over the expected useful life. Thermal management shall be by passive design – the use of fans or other mechanical devices is not allowed.
- E. LED Lighting Fixtures (Huntington Station Only)
1. Color temperature of any submitted fixture shall be within 10% of the specified value, 3000 degrees K.

2. Provide fixture housing with connections to ~~integral driver under a~~ fixture power ~~canopy mounting plate~~, LED board and Spot (20-degree) optical focus lens. Clear tempered, shock resistant glass lens shall be adhered to fixture cap to provide a hermetically sealed optical compartment.
3. Lens cap of fixture shall be 90 degree cut off type and provided with lens holder for use of directional linear lens accessory. ~~The lens holder shall be 'fixed' to the correct position (relative to axis of fixture) to ensure that the fixture is aimed properly as directed by the Authority Representative. See Architectural Drawing for specified lens orientation. Directional lens will not be used in every fixture and shall not be 'permanently' attached to holder.~~
4. Lighting fixtures shall be constructed of copper-free aluminum, finish and color as specified by the Authority Representative. Fixture housing, lens cap, LED board, optic module and lens accessory to be provided with natural physical 'stop'/locking devices to obtain and ensure optimum light output/focus.
5. Mounting hardware and fixture screws shall be stainless steel.
6. Power consumption of any submitted fixture shall not exceed the specified value of 28 Watts by more than 10%. If a fixture is submitted and approved at an increased wattage within 10% of the specified wattage), any power system modifications necessary to accommodate the fixtures will be the responsibility of the contractor (i.e. increased wire sizes, increased circuit breaker size, additional circuits/breakers, etc.)
7. LED Lumen Efficacy (Lumens/Watt) of a submitted fixture shall not be less than the specified fixture (34 lumens/watt) by more than 10%. Fixture lumen output shall provide at steps and escalator comb plate an average illumination level of 10FC maintained, 16FC initial as required by WMATA Manual of Design Criteria for Stations.
8. Characteristics of submitted fixtures shall have the same features as the specified LED fixtures (i.e. ~~redundant compatibility with remote~~ drivers, driver protection, etc.) whether specifically noted on the lighting fixture schedule or not.
9. LED Light fixtures shall have a minimum expected life of 50,000 hours. The aforementioned life rating must be conducted with a 40 degrees calcium ambient temperature.
10. Operational Performance: the LED circuitry shall prevent visible flicker.
11. Thermal Management: The thermal management (of the heat generated by the LED's) shall be of sufficient capacity to assure the proper operation of the luminaire over the expected useful life. Thermal management shall be by passive design – the use of fans or other mechanical devices is not allowed.

F. Control Power Transformers (All Stations Except Huntington Station)

1. Transformer: NEMA ST 1; machine tool transformer with isolated secondary winding.
2. Enclosure: Open Type (mounted in junction box)

3. Power Rating: 100 VA.
4. Voltage Rating: 120VAC primary; 12VAC secondary.

G. Remote LED Driver (Huntington Station Only)

1. Housing

- G.a. Copper free, aluminum extrusion with die cast end caps. Surface mounted with flow through back channel to prevent water and debris collection. Machined aluminum cover with countersunk holes for flush hardware installation. Tamper-resistant, captive, black oxide stainless steel mounting screws. Front access for ease of installation and inspection. [2] 1/2" NPT female conduit entries per end cap for through wiring.
- b. [1] 700mA, Class A, constant current driver. 120/277VAC (nominal) primary input voltage. 50/60Hz. > 0.90. Power Factor, < 15.0A in-rush current. < 20%THD (nominal at 120VAC full load). Output over-voltage, over-current, and short circuit protection with auto recovery. EMC:FCC47CFR Part 15 Class B compliant. Dimming driver for use with LED fixtures. 10-100% range.
- c. Power Output: Sufficient capacity to power a Huntington LED Lighting Fixture listed above.

H. Boxes, Gaskets, Hardware, and Support Devices:

1. Provide plastic outlet boxes, neoprene gaskets, and stainless steel hardware to render the installation of the lighting waterproof.
2. Supply special mounting supports and hardware, and miscellaneous materials and incidentals required to install the lighting products in place.

I. Electronic/ Digital Astronomic Timer Switch:

1. Scheduling: 20 ON & OFF set points for individual programs for each day of the week. Minimum setting is 1 minute.
2. Astronomic: Adjustable 10° - 60° Northern or Southern latitudes. Can be individually offset +/- 1-240 minutes from both sunset and sunrise times.
3. Daylight Savings: Automatic (can be omitted).
4. Leap Year: Automatic Compensation.
5. Manual Override: Until the next regularly scheduled ON or OFF, automatic operation then resumes.
6. Clock Format: AM/PM.
7. Power Outage Backup: Permanent schedule retention. Supercapacitor provides 4 days of real time backup.
8. Operate on 120/277V.
9. Enclosure: Plastic Indoor/Outdoor NEMA 3R is standard with lockable hasp.
10. Dual Contact (Two Channel) ampere rating: 40 amps
11. Provide double position, single throw (DPST) switch

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to beginning installation of the lighting fixtures and accessories, verify that all other work affecting the installation of the lighting fixtures and accessories is complete to the extent that the light fixtures may be installed over substrates or incorporated into integrated systems without adversely affecting the lighting or other construction.

3.2 INSTALLATION

- A. Assemble lighting fixtures if required; and install and wire the lighting fixtures, supports, brackets, and accessories at the locations and mounting heights indicated on the Contract Drawings.
 - 1. Wire the lighting fixtures and accessories as specified in Section 26 05 19.
 - 2. Ground the lighting fixtures in accordance with the requirements of Article 410 of NFPA 70 (NEC) and Section 26 05 26.
 - a. Use the fixture grounding device to connect a separate grounding conductor in compliance with requirements specified in Section 26 05 26.
- B. Exposed Fixture Installation:
 - 1. Install surface mounted and exposed fixtures as indicated on the Contract Drawings.
 - a. Install surface mounted fixtures tight up against the substrate to eliminate gaps except where NFPA 70 (NEC) or local code restrictions require a separation between the fixtures and substrate.

3.3 INTERFACE WITH OTHER WORK

- A. Verify the locations and clearances of other installed or proposed work, and coordinate lighting fixture installations accordingly.
- B. Coordinate the installation of lighting fixtures with all building systems and components to avoid any installation conflicts.

3.4 FIELD QUALITY CONTROL

- A. Inspect, test, and certify lighting and the associated electrical distribution system and equipment in accordance with the requirements of Section 26 05 63.

3.5 CLEANING

- A. Clean new lighting fixtures by following the cleaning procedures as recommended by the fixture manufacturer:

1. Use only those products for cleaning as recommended in the fixture manufacturer's literature.

3.6 AIMING AND FOCUSING

- A. Contractor shall notify the Authority Representative one week in advance and establish schedule for a night when final aiming will be done. Final aiming shall be as directed by the Authority Representative. Aiming shall include adjustment of fixture angle, use of and orientation of linear lens accessory and lens SP selection.
- B. Lock the aiming adjustments, set during final aiming, in position. Position must hold during relamping and normal maintenance.

END OF SECTION

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