COLLEGE OF STATEN ISLAND
The City University of New York

ST007-005 – Lighting for Public Safety – College Of Staten Island

Technical Specifications

(Issued for Bid)

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SUBMITTED BY:

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DIVISION 16

ELECTRICAL

SECTION 16055

GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install firestopping material at penetrations through fire rated structures and draft stops.

1.2 SUBMITTALS

A. Product Data
   1. Submit for following -
      a. Wiring devices
      b. Disconnects
      c. Lighting fixtures, poles, and associated control equipment
      f. Conduit
      g. Fire stopping
      h. Weatherproofing (sealant)
      i. Paint
   2. Provide following information for each item of equipment -
      a. Catalog Sheets.
      b. Assembly details or dimension drawings.
      c. Installation instructions.
      d. Manufacturer's name and catalog number
      e. Name of local supplier.
   3. Do not purchase equipment before approval of product data.

C. Shop Drawings - Panelboards

D. Closeout Submittals
   1. Operations & Maintenance Manual Data -
      a. Modify and add to requirements of Section 01700 as follows -
         1) Provide operating and maintenance instructions for each item of equipment submitted under Product Data.
         2) Include copy of approved shop drawings.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies
   1. NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
   2. Material and equipment provided shall meet standards of NEMA or UL, and bear their label wherever standards have been established and label service is available.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

A. Confirm dimensions, ratings, and specifications of equipment to be installed and coordinate these with site dimensions and with other Sections.

3.2 INSTALLATION

A. Mounting Heights
   1. Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor -
      a. ATC Junction Boxes - As indicated on Drawings
      b. Switches - 42 inches
   2. Refer special conditions to Engineer before rough-in and locate outlet under his direction.

3.3 FIELD QUALITY CONTROL

A. Site Tests - Test systems and demonstrate equipment as working and operating properly. Notify Engineer prior to test. Rectify defects at no additional cost to Owner.

END OF SECTION

SECTION 16120

CONDUCTORS & CABLES

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Quality of conductors used on Project except as excluded below.

B. Related Sections
   1. Section 16055 - General Electrical Requirements

PART 2 PRODUCTS

2.1 COMPONENTS

A. Conductors
   1. Copper -
      a. Minimum size shall be No. 12 except where specified otherwise.
      b. Conductor size No. 8 and larger shall be stranded.
   2. Insulation -
      a. Conductor size No. 10 & Smaller - 600V type THWN or XHHW (75 deg C)
      b. Conductor Size No. 8 & Larger - 600V Type THW, THWN, or XHHW (75 deg C)
      c. Higher temperature insulation as required by NEC or local codes.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install conductors in raceway except where specifically indicated otherwise. Run conductors of different voltage systems in separate conduits.

B. Conductors shall be continuous from fixture to fixture.

C. Route circuits at own discretion, however, circuiting shall be as shown in Panel Schedules. Group circuit homeruns to panels as shown on Drawings.

D. Where common neutral is run for two or three home run circuits, connect phase conductors to breakers in panel which are attached to separate phase legs in order that neutral conductors will carry only unbalanced current. Neutral conductors shall be of same size as phase conductors unless specifically noted otherwise.

E. Pulling Conductors
   1. Do not pull conductors into conduit until raceway system is complete and cabinets and outlet boxes are free of foreign matter and moisture.
   2. Do not use heavy mechanical means for pulling conductors.
   3. Use only UL listed wire pulling lubricants.

F. Conductor Colors
   1. Use following color code -
      a. Black - Phase A
      b. Red - Phase B
      c. Blue - Phase C

d. Green - Ground
e. White - Neutral

2. Conductors size No. 10 and smaller shall be colored full length. Tagging or other methods for coding of conductors size No. 10 and smaller not allowed.

END OF SECTION

SECTION 16132

RACEWAY & CONDUIT

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Quality of material and installation procedures for raceway and fittings used on Project but furnished under other Divisions.
   2. Furnish and install raceway and conduit used on Project not specified to be installed under other Sections.

B. Related Sections
   1. Section 16055 - General Electrical Requirements
   2. Section 16120 - Conductors and Cables

PART 2 PRODUCTS

2.1 COMPONENTS

A. Raceway & Conduit
   1. Galvanized rigid steel or galvanized intermediate metal conduit (IMC) is allowed for use in all areas.
   2. Galvanized Electrical Metallic Tubing (EMT) -
      a. Allowed for use only in indoor dry locations where it is -
         1) Not subject to damage.
         2) Not in contact with earth.
         3) Not in concrete slabs on grade.
   3. Flexible Steel Conduit -
      a. 1/2 inch minimum
      b. Required for final connections to indoor equipment, length not to exceed 36 inches.
      c. Also allowed for use in indoor dry locations -
         1) In accessible ceilings not to exceed 72 inches.
         2) Where concealed in walls and inaccessible floors and ceilings.
   4. UL Listed, Liquid-tight Flexible Metal Conduit - Use in outdoor final connections to equipment, length not to exceed 36 inches.
   5. Prewired 3/8 Inch Flexible Fixture Whips - Allowed only for connection to recessed lighting fixtures, lengths not to exceed 72 inches.
   6. Prohibited Raceway Materials -
      a. Aluminum conduit.
      b. Electrical Nonmetallic Tubing (ENT) conduit.
      c. Armored cable type AC (BX) cable
      d. Metal-clad cable type MC cable

B. Raceway & Conduit Fittings
   1. Rigid Steel Conduit & IMC - Threaded and designed for conduit use.
   2. EMT -
      a. Compression type
      b. Steel set screw housing type.
   3. Flexible Steel Conduit - Screw-in type
   4. Liquid-tight Flexible Metal Conduit - Seal Tite type
   5. Prohibited Fitting Materials -

a. Crimp-on, tap-on, indenter type fittings.
b. Cast set-screw fittings for EMT.
c. Spray (aerosol) PVC cement.

PART 3 EXECUTION

3.1 INSTALLATION

A. Interface With Other Work
1. Install pull wires in raceways installed under this Section where conductors or cables are to be installed under other Divisions.

B. Conceal raceways within ceilings, walls, and floors. Conduit may be exposed on walls or ceilings of mechanical equipment areas and above acoustical panel suspension ceiling systems. Install exposed raceway runs parallel to or at right angles to building structure lines. Paint all exterior conduit to match building surface.

C. Securely support raceway within 3 feet of every 90 degree bend, outlet box, junction box, device box, cabinet, conduit body, and other termination with approved straps, clamps, or hangers. Space supports every 10 feet maximum. Securely mount raceway supports, boxes, and cabinets in an approved manner by
1. Expansion shields in concrete or solid masonry.
2. Toggle bolts on hollow masonry units.
3. Wood screws on wood.
4. Metal screws on metal.

D. Cap raceway ends during construction. Clean or replace raceway in which water or foreign matter have accumulated.

E. Do not bore holes in joists or beams outside center 1/3 of member depth or within 2 feet of bearing points. Do not bore holes in vertical framing members outside center 1/3 of member width. Holes shall be one inch diameter maximum.

F. Prohibited Procedures
1. Use of wooden plugs inserted in concrete or masonry units for mounting raceway, supports, boxes, cabinets, or other equipment.
2. Installation of raceway which has been crushed or deformed.
3. Use of torches for bending PVC.
4. Spray applied PVC cement.
5. Boring holes in truss members.
6. Notching of structural members.
7. Supporting raceway from ceiling system support wires.
8. Nail drive straps for supporting raceway.

END OF SECTION

SECTION 16150

WIRING CONNECTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Quality of wiring connections used on Project.

B. Related Sections
   1. Section 16055 - General Electrical Requirements

PART 2 PRODUCTS

2.1 COMPONENTS

A. Standard Connectors
   1. Conductors No. 8 & Smaller - Steel spring wire connectors
   2. Conductors Larger Than No. 8 - Pressure type terminal lugs

B. Terminal blocks for tapping conductors
   1. Terminals shall be suitable for use with 75 deg C copper conductors.
   2. Acceptable Manufacturers & Models -
      a. Square D LBA363106
      b. Bussman 16323
      c. Equal as approved by Engineer/Owner.

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 16410

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes individually mounted enclosed switches and circuit breakers, rated 600 V and less, used for disconnecting and protection functions.

1.2 SUBMITTALS

A. Product Data: For each type of switch and circuit breaker indicated.

B. Shop Drawings: Include wiring diagrams for shunt-tripped circuit breakers.

C. Field quality-control test reports.

D. Operation and maintenance data.

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. Source Limitations: Obtain switches and circuit breakers through one source from a single manufacturer.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Eaton Corp.; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Division.
3. Siemens Energy & Automation, Inc.
4. Square D Co.

2.2 ENCLOSED SWITCHES

A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle, interlocked with cover.

B. Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, with clips to accommodate specified fuses, and lockable handle, interlocked with cover.

2.3 ENCLOSED CIRCUIT BREAKERS

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
4. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

2.4 ENCLOSURES

A. Listed for environmental conditions of installed locations, including:

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Temporary Provisions: Remove temporary lifting provisions and blocking of moving parts.

B. Identify components; provide warning signs as specified in Division 16 Section “Basic Electrical Materials and Methods.”

3.2 FIELD QUALITY CONTROL

A. Testing: After installing disconnect switches and circuit breakers and after electrical circuits have been energized, demonstrate product capability and compliance with requirements.

B. Inspections and Tests for Switches and Circuit Breakers: Make internal and external inspections and perform tests, including the following:

1. Inspect for freedom from physical damage, proper unit rating, mechanical condition, enclosure integrity, cover operation, unit anchorage, clearances, and tightness of electrical connections. If a loose electrical connection is observed on any unit, check each electrical connection for each switch and circuit breaker with a torque wrench for compliance with manufacturer's torquing instructions.
2. Test insulation resistance of each pole, phase-to-phase, and phase-to-ground, following manufacturer's written instructions. Test insulation resistance of shunt trip circuits. Use 500-V minimum test voltage for units and circuits rated up to 250 V, 1000-V minimum test voltage for units rated more than 250 V. Measured insulation resistance must be 25 megohms, minimum, for switches rated up to 250 V, and 100 megohms, minimum, for switches rated more than 250 V.
3. Test cover and other interlocks and interlock release devices for proper operation.

C. Additional Inspections and Tests for Switches: Include the following:

1. Inspect for proper rating and fuse provisions.
2. Check adequacy and integrity of fuseholders by removing and installing fuses.
3. Check integrity of phase barriers.
4. Inspect blade alignment visually while operating switch to observe adequacy of blade pressure.

D. Additional Inspections and Tests for Circuit Breakers: Include the following:

1. Inspect for proper frame, trip, and fault current interrupting rating.
2. Test shunt trip devices, circuits, and actuating components for proper operation.

E. Correct defective and malfunctioning units on-site, where possible, and reinspect and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION

SECTION 16520

EXTERIOR LUMINAIRES

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install exterior lighting system as described in Contract Documents except for concrete bases for light poles.

B. Products Supplied But Not Installed Under This Section
   1. Anchor bolts

C. Related Sections
   1. Section 16055 - General Electrical Requirements

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Building Mounted Site Lighting Fixtures
   1. See Fixture Schedule on drawings for manufacturer and model #.
   2. Finish shall meet requirements of AAMA 603.8 for baked-on organic coating, AAMA 605.2 high performance organic coating, or AAMA Architectural Class I anodizing as necessary to provide specified color.
   3. Color shall be Manufacturer's standard white, natural aluminum, or medium bronze as selected by Engineer/Owner.

B. Lighting Fixture Extension Poles
   1. Designed for wind loading required per NYC Building Code.
   2. Aluminum anchor base type with matching aluminum anchor bolt cover secured to parapet wall.
   3. Include handhole with cover at pole base.
   4. Include hinged base for ease of maintenance.
   4. Finish & Color - Match building mounted fixtures.

C. Conduit
   1. Type as specified in Section 16132.
   2. Do not use direct burial cable.

D. Exterior Lighting Control
   1. Time Switch -
      a. Standard 24 hour dial time switch, 120/277 volts
      b. Approved Manufacturers & Models -
         1) Intermatic
         2) Tork
         3) Paragon
         4) Asco
         5) Or approved equal
   3. Lighting Contactor -
      a. 120 / 277 volt coil, 20 amps, 2 pole, NEMA 1 enclosure.
      b. By same manufacturer as main panelboard.
      c. Approved Manufacturers & Models -

1) Challenger
2) Cutler Hammer
3) General Electric
4) ITE/Siemens
5) Square D
6) Westinghouse

PART 3 EXECUTION

3.1 INSTALLATION

A. Interface With Other Work - Coordinate location of anchor bolts and conduit in bases so pole will be properly mounted and centered on parapet wall.

B. Install time switch and contactor inside building to control site lighting.

C. If hinged light pole bases are used, install to miss major landscaping elements and permanent obstructions when lowered.

END OF SECTION