SECTION 28 13 00

ELECTRONIC ACCESS CONTROL SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes: A complete and operational Electronic Access Control System to include the following:

1. Access Control Hardware Components:
   a. PoE Door Controller
   b. PoE Downstream Door Controller
   c. Card Reader with Key Pad
   d. Card Reader without Key Pad
   e. Motion Sensors
   f. Credentials
   g. Request To Exit (REX) Pushbutton
   h. Door Strikes
   i. Magnetic Locks (Maglocks)
   j. Door Position Switch
   k. Power Supply
   l. Access Control Enclosure
2. Software Licensing
3. System installation into the following WMATA's Facilities:
   a. Rail Structures and Facilities
   b. Parking Garages
   c. Bus Divisions
   d. Support Buildings

B. Related Requirements:

1. Section 08 31 13 Access Doors and Frames
2. Section 08 33 23 Overhead Coiling Doors
3. Section 08 70 00 Finish Hardware
4. Section 26 05 88 Raceway, Boxes and Cabinets for Electrical Systems
5. Section 27 00 30 Communications Standard Specifications-Engineering Services
6. Section 27 00 40 Communications Standard Specifications-Installation
7. Section 27 06 05 Communications Standard Specifications-Equipment & Material
8. Section 27 00 60 Communications System Submittals & Services
9. Section 27 00 70 Communications System Quality Assurance & Testing
10. Section 27 05 26 Grounding and Bonding for Communications Grounding Systems

11. Section 27 05 14 Communications Electrical Power Distribution
12. Section 27 02 10 Communications – Kiosk Systems
13. Section 34 21 04 Wire, Cable, and Busways

1.03 REFERENCES

A. Abbreviations and Acronyms:

1. EIA – Electronics Industries Alliance

B. Reference Standards:

1. EIA RS 170 – Standard for Defining the Timing of Broadcast Video in the United States
2. Federal Standard 595B, Colors Used in Government Procurement
3. NFPA 70 - National Electrical Code
4. NFPA 130 – Standard for Fixed Guideway Transit Systems
5. UL 1076 – Proprietary Burglar Alarm Units and Systems
6. WMATA Communications Standard Drawings
7. WMATA Design and Wiring Standards rev1 May 2014

1.04 SUBMITTALS

A. Product Data: For each type of component, equipment, and product indicated.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for all products and equipment.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
3. Provide product data sheets for each component, equipment, and product, and resubmittal for changes as a result of required modification.

B. Manufacturer's Installation Instructions:

1. Indicate application conditions and limitations of use, stipulated by Product testing agency.
2. Include instructions for storage, handling, protection, examination, preparation, installation, and start-up of Product.

C. Design:

1. Submit the optimum design layout of the new access controlled doors and devices specifications prior to installing any equipment. The Contractor will use the layout to determine the adequacy of the design and, in conjunction with a field survey, determine the exact location of each Access Control device

D. Design Drawings:

1. Proposed changes and revised equipment layouts.
2. System riser diagrams to include source of power.
3. Access Control equipment mounting details.
4. Completed door controllers and equipment schedules.

E. As-Built Documents: Prior to Substantial Completion, develop As-Built documents as follows:

1. As-Built Drawings of the Electronic Access Control system installation to include, but not be limited to camera layouts, communication and power cable pathways and wiring, equipment details and equipment schedules.
2. Approved copies of each submittal.

F. Certification:

1. Certificates from manufacturers verifying that equipment conforms to the specified requirements.

G. Shop Drawings:

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

H. Qualification Data: For Installer, Manufacturer, Fabricator, and testing agency.

I. Product Certificates: For each component, equipment, and product. Sample Warranty: For manufacturer's warranty.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance (O & M) manuals

1. Complete printed operating instructions in manual or handbook form, completely and clearly indexed for ready reference during actual operation and for use as text during instruction of personnel.
2. Include descriptions of systems, background information, and complete procedures for adjustment, calibration, replacement, and repair of components in system.
3. Make data contained specific for and exclusive to the systems and equipment for the work of this Contract.
4. Field test data and reports.

1.06 EXTRA MATERIALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Provide spare parts and/or equipment for no less than 10% of new items.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Equipment manufacturer: Select a manufacturer who is engaged in production of similar Access Control products and accessories.

B. Fabricator Qualifications:

1. Equipment supplier: A manufacturer authorized distributor of specified products with minimum of three years documented experience.

C. Installer Qualifications:

1. Equipment installer: A manufacturer authorized installer of specified products with service facilities within 100 miles of WMATA.

D. Coordination:

1. Installer shall coordinate Access Control installation with all other concurrently running work at the location specified under this task.

E. The Contractor shall develop test procedures and obtain Engineer approval prior to final acceptance testing.

F. The Contractor shall perform progressive tests in accordance with the approved test procedure to verify compliance with specified system performance requirements, including but not limited to proper component operation, and software operations.

1. The Contractor's Quality Assurance Engineer shall witness all progressive testing.
2. All discrepancies found during testing shall be corrected and test reports submitted prior to scheduling end-to-end testing.
3. The Contractor shall notify the Engineer prior to commencing progressive testing and shall offer the Engineer the opportunity to witness the testing. Witnessing of any portion of the progressive testing by the Engineer shall not relieve the contractor from responsibility for any portion of follow-on testing.

G. End-to-End Test:

1. The Contractor shall demonstrate the proper functioning of the completed Access Control system.
2. Each access control device shall operate as specified in the design drawings and be properly configured on the access control software.
3. The Contractor shall submit certified test reports within 10 working days after completion of field tests.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:

1. Deliver all components, devices, equipment, and products in their original sealed containers and packaging.
2. Protect, store, and handle as per manufacturer's written instructions and as per WMATA's project requirements.
3. Refer to Section 01 61 00 Basic Product Requirements for additional information.

1.09 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of all PoE controllers and all card readers that fail(s) in materials or workmanship within specified warranty period.

1. Warranty Period:
   a. 1-year from date of Substantial Completion for all PoE controllers.

b. 2-years from date of Substantial Completion for all card readers.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. **PoE DOOR CONTROLLER:**

1. Basis of Design: Honeywell PW6K1ICE
   a. Power Input:
      1) Power over Ethernet (PoE) 12.95W
      2) 12 VDC, 200 mA min, 900 mA max
   b. Power Output:
      1) 12 VDC @ 650 mA (reader and AUX outputs combined)
      2) 10.3 – 12.6 VDC reader output @ 150 mA max
      3) 10.7 – 13.0 VDC AUX power output @ 700 mA max
   c. Environmental Factors:
      1) Operating temperature: 0°C to 70°C (32°F to 158°F)
      2) Humidity: 10 - 95% RHNC
      3) Storage conditions: -55°C to 85°C (-67°F to 185°F)
   d. Host Communication: RJ-45 for 10BASE-T/100BASE-TX PoE interface
   e. Inputs: 2 supervised, programmable end of line resistors, 1k/1k-ohm 1% 1/4 watt standard, and dedicated tamper switch
   f. Relays: 2 outputs, Form-C contacts: 2A @ 30 VDC
   g. Reader Module:
      1) Configuration: wiegand or OSDP
      2) Reader Power: 12VDC 10% or local power supply
      3) Reader Data Inputs: Two TTL reader ports or one 2-wire RS-485 reader port capable of supporting two readers
   h. Cable Requirements:
      1) Power: 1 twisted pair, 18 AWG
      2) Ethernet: CAT-6
      3) Reader Data (TTL): 18 AWG – 6 conductors, 500 ft. (150 m) max
      4) Reader Data (RS-485): 24 AWG, 120Ω impedance, twisted pair with shield, 4,000 ft. (1,219 m) max
      5) Alarm Input: 1 twisted pair per input (30Ω max loop resistance)
   i. Compatibility:
      1) Access Control Software: the door controller shall be compatible with the access control server. The access control software configures the door controller. The door controller sends a transaction log on real time to the access control server through the WMATA's WAN network.
      2) Card Readers: the reader module which is part of the door controller shall be compatible with the wiegand output of Mifare Plus S and 125 kHz proximity readers.

B. **PoE DOWNSTREAM DOOR CONTROLLER**

1. Basis of Design: Honeywell PW6K1R1E. Up to 16 PW6K1R1E downstream boards can be connected to PW6K1ICE controller board.
   a. Power Input:
      1) Power over Ethernet (PoE) 12.95W
      2) 12 VDC, 200 mA min, 900 mA max
   b. Power Output:
      1) 12 VDC @ 700 mA max (reader and AUX outputs combined)
      2) 10.3 – 12.6 VDC reader output @ 150 mA max
      3) 10.7 – 13.0 VDC AUX power output @ 700 mA max
   c. Environmental Factors:

1) Operating temperature: -40°C to 75°C (-40°F to 167°F)
2) Humidity: 10 - 95% RHNC
3) Storage conditions: -55°C to 85°C (-67°F to 185°F)

d. Host Communication: RJ-45 for 10BASE-T/100BASE-TX PoE interface
e. Inputs: 4 unsupervised/supervised, Programmable End of Line resistors, 1k/1k-ohm 1% 1/4 watt standard, and dedicated tamper switch
f. Relays: 2 outputs, Form-C contacts: 5A @ 28 VDC
g. Reader Module:
1) Reader Power: 12VDC 10% or local power supply
2) Reader Data Inputs: Two TTL reader ports or one 2-wire RS-485 reader port capable of supporting two readers

h. Cable Requirements:
1) Power: 1 twisted pair, 18 AWG
2) Ethernet: CAT-5 (minimum)
3) Reader Data (TTL): 18 AWG – 6 conductors, 500 ft. (150 m) max
4) Reader Data (RS-485): 24 AWG, 120Ω impedance, twisted pair with shield, 4,000 ft. (1,219 m) max
5) Alarm Input: 1 twisted pair per input (30Ω max loop resistance)

i. Reader Data Inputs: Two TTL reader ports or one 2-wire RS-485 reader port
j. Compatibility:
1) Access Control Software: the downstream door controller shall be compatible with the access control server. The access control software configures the downstream door controller. The downstream door controller sends a transaction log to the access control server on real time through the WMATA's WAN network.
2) Card Readers: the reader module which is part of the door controller shall be compatible with the wiegand output of Mifare Plus S and 125 kHz proximity read.

C. **CARD READER WITH KEY PAD (indoor/outdoor)**

1. Basis of Design: HID multiCLASS SE RPK40 model 921PTNNEK0034Y The RP40 is 920PTNNEK0011D
a. Power Supply: 5.5 – 16 VDC (12 VDC recommended)
b. Current Consumption @ 12 VDC:
1) Average: 95 mA
2) Peak: 200 mA
c. Typical Read Range:
1) 13.56 MHz: 1.5 - 4 inch
2) 125 kHz: 1.5 – 2.5 inch
d. Communications: Wiegand/Clock-and-Data Interface
e. Operating Temperature: -31°F - 150°F
f. Protection Class: IP55; IP65 if installed with optional gasket (IP65GSKT)
g. Cards: Mifare Plus S, 26-Bit and 37-Bit 125 kHz proximity cards.

D. **CARD READER WITHOUT KEY PAD (indoor/outdoor)**

1. Basis of Design: HID multiCLASS SE RPK40 model 920PTNNEK0011D
a. Power Supply: 5.5 – 16 VDC (12 VDC recommended)
b. Current Consumption @ 12 VDC:
1) Average: 95 mA
2) Peak: 200 mA
c. Typical Read Range:
1) 13.56 MHz: 1.5 - 4 inch
2) 125 kHz: 1.5 – 2.5 inch
d. Communications: Wiegand/Clock-and-Data Interface
e. Operating Temperature: -31°F - 150°F
f. Protection Class: IP55; IP65 if installed with optional gasket (IP65GSKT)
g. Cards: Mifare Plus S, 26-Bit and 37-Bit 125 kHz proximity cards.

E. **CARD READER WITH KEY PAD (indoor mullion installation)**

1. Basis of Design: Oberthur ID One Secure Pac reader. Model 125 14443 DF PIN 500-5045 with WMATA profile
   a. Power Supply: 7 – 24 VDC (12 VDC recommended)
   b. Current Consumption @ 12 VDC:
      1) Average: 110 mA
      2) Peak: 171 mA
   c. Typical Read Range:
      1) Mifare ISO card: 60 mm (2.4 inch)
      2) LF Proximity ISO card: 30 – 60 mm (1.2 – 2.4 inch)
   d. Host Communication: RJ-45 for 10BASE-T/100BASE-TX PoE interface
   e. Operating Temperature: -25°C - 65°C (-15°F - 150°F)
   f. Protection Class: IP54
   g. Cards: Mifare Plus S, 26-Bit and 37-Bit 125 kHz proximity cards.

F. **CARD READER WITHOUT KEY PAD (indoor mullion installation)**

1. Basis of Design: Oberthur ID One Secure Pac reader. Model 125 14443 DF 500-5005 with WMATA profile.
   a. Power Supply: 7 – 24 VDC (12 VDC recommended)
   b. Current Consumption @ 12 VDC:
      1) Average: 110 mA
      2) Peak: 146 mA
   c. Typical Read Range:
      1) Mifare ISO card: 60 mm (2.4 inch)
      2) LF Proximity ISO card: 30 – 60 mm (1.2 – 2.4 inch)
   d. Host Communication: RJ-45 for 10BASE-T/100BASE-TX PoE interface
   e. Operating Temperature: -25°C - 65°C (-15°F - 150°F)
   f. Protection Class: IP54
   g. Cards: Mifare Plus S, 26-Bit and 37-Bit 125 kHz proximity cards.

G. **MOTION SENSORS**

1. All motion sensors shall be able to be powered by either 12 VDC or 24 VDC.
   a. Ceiling Mount: high performance panoramic, dual element sensor Bosch DS938Z or approved equal
   b. Wall Mount: high performance panoramic, dual element sensor Bosch DS778Z or approved equal
   c. Request to Exit (REX) Motion Sensor: Bosch DS150i or Securitron XMS, or approved equal

H. **CREDENTIALS**

1. Mifare Plus S which supports ISO/IEC 14443 Type A with communication speed up to 848 kbit/s.
   a. Basis of Design: NXP model MF1SPLUS6001DA4 in MOA4 module form

I. **REQUEST TO EXIT (REX) PUSHBUTTON**

1. Plastic button:
   a. Basis of Design: Alarm Controls TS-2
2. Metal button:
   a. Basis of Design: Schlage Locknetics 620 series

J. **DOOR STRIKES**

1. Refer to the Access Control Standard Drawings for door details and door strikes type.
2. Door strikes to be able to be powered by either 12VDC or 24VDC.

K. **MAGNETIC LOCKS (MAGLOCKS)**

1. All Maglocks shall be able to be powered by either 12VDC or 24VDC.
   a. Basis of Design: Securitron M62 series

L. **DOOR POSITION SWITCH**

1. Basis of Design: Sentrol 1076C
   a. Similar color of the door frame.

M. **POWER SUPPLY**

1. All power supplies to deliver at least 2 Amps @ 12 VDC or 24 VDC.
   a. Basis of Design: SDC 602RF

N. **ACCESS CONTROL ENCLOSURE**

1. Refer to the WMATA Communications Standard Drawings for devices installed inside and mounting details.

O. **SOFTWARE LICENSE**

1. Stand Alone Applications: access control software compatible with card readers described above and the use of Mifare Plus S cards. Pro-Watch corporate edition or approved equal
2. Addition to the existing system: new access controlled doors shall be configured on the existing access control software adding the proper amount of card licenses

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation of devices covered by these specifications shall comply with the Access Control Standard drawings

B. Installation of access control devices shall be performed in a neat and professional manner and retain all elements of the rail and bus system's architectural excellence

C. Installation of access control devices shall be coordinated with work of other trades

D. Access Control equipment shall be installed in accordance with manufacturer's instructions

E. Access Control equipment shall not be installed over tracks or extend beyond the inside of the platform edge granite unless otherwise specified and approved.

F. All cables shall be installed and tested in accordance with the most current WMATA Design and Wiring Standards

G. Software Configuration:

1. Configure and document all parameters chosen during the configuration of all new devices the access control software.
2. The Contractor shall configure new devices on the access control software with the supervision of the WMATA engineer.

3.02 FIELD QUALITY CONTROL

A. Design and Performance Testing: Perform tests and submit results in accordance with the General Provisions, certified test results for the Access Control system installed under this contract

B. Acceptance Testing:

1. Furnish equipment required to perform tests.
2. Comply with WMATA approved system testing
3. Perform approved tests to verify that the Access Control systems comply with requirements shown and specified

C. The Contractor is responsible for testing all power and communications signals in accordance with WMTA's Design and Wiring Standards

3.03 DEMONSTRATION

A. Conduct walking tour of Project and briefly describe function, operation and maintenance of the system components

B. Demonstrate operation and maintenance of the system to WMATA personnel two weeks prior to date of Substantial Completion

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with WMATA personnel in detail to explain all aspects of operation and maintenance

D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at equipment location

E. Prepare and insert additional data in operations and maintenance manuals as needed for additional data becomes apparent during instruction

F. Operational and Maintenance Training:

1. Train Owner's maintenance personnel to adjust, operate, and maintain units.
2. For complete requirements, refer to the General Requirements Section 01 82 00 Demonstration and Training.

END OF SECTION