PART 1 - GENERAL

1.01 SUMMARY

A. The work consists of providing and installing prescribed systems and equipment, in accordance with Denver Public School District (DPS) directives and needs. The Division 281300 Contractor shall install, and configure systems to provide the exact function described herein and will be held to the operational criteria. Division 281300 Contractor shall be responsible for providing and installing a complete and fully operational system, with the intended features and capabilities, whether or not all required parts, components, systems or accessories are specified in the construction documents. Division 281300 Contractor shall provide all required parts, components, systems, materials and accessories needed for a complete and working system, without additional cost to DPS.

B. Furnish all labor, materials, tools, equipment, door hardware, and services for all Access Control Equipment, as indicated, in accord with provisions of Contract Documents.

C. Architect shall provide the Division 087100 specification consultant a complete door schedule for both new and existing openings identifying door numbers prior to the development of construction documents.

D. DPS shall provide the Architect a security map of all device locations and technical specifications prior to development of Construction Documents. Architect to forward the security map to specification consultants for Section 087100 and Division 28 sections for developing hardware sets. Architect shall not alter technical specifications for division 087100 and Division 28 sections, device locations or electrified hardware sets without approval of DPS Security Department. If Architect alters or allows such document changes without DPS written approval the Architect assumes all liability and/or cost associating with document and hardware changes.

E. Prior to Construction Documents the Architect shall develop a map indicating door numbers and hardware sets for electrified hardware to be known as the Electronic Access Control – Intrusion map on a unique page for review by DPS Security department.

F. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices and access control system. Electro-Mechanical Hardware requires meticulous coordination among:
   1. Architect.
   2. Electrical engineer.
   3. Hardware supplier/contractor.
   4. Electro-mechanical hardware supplier/contractor.
   5. Frame supplier/contractor.
   6. Electrical Contractor.
   7. Security systems Contractor

G. Items include but are not limited to the following:
   1. Reader Controller.
   2. Access Control Locksets and Electronic Panic Hardware and Trim
   3. Electrified Door Hardware
4. Reader Interface.
5. Power Supply.
7. Wiring, switches, and ancillary equipment.
8. Door position Switch
9. Request to Exit Device
10. Door Release Button
11. Although such work is not specifically indicated, provide and install supplementary or miscellaneous items, appurtenances and devices incidental to, or necessary for, a sound, secure and complete and functional installation.

H. Intent of Access Control specification

1. The following specification shall be considered a guide only, and the Contractor is cautioned to refer to general conditions, special conditions, and the preamble of this section. It shall be the Contractor’s responsibility to furnish systems and equipment, in accordance with DPS directives and needs.
2. Where items aren’t definitely or correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy shall be sent to the Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
3. Adjustments to the Contract Sum will not be allowed for omissions not clarified prior to bid opening.

1.02 RELATED SECTIONS
A. Division 8: Steel Doors and Frames.
B. Division 8: Wood Doors.
C. Division 8: Aluminum Storefront.
D. Division 8: Door Hardware
E. Division 26 - Sections for connections to electrical power system, conduit, and electrical boxes for access control devices installed at door openings and provided as part of a security access system.
F. Division 27 – Communications Requirements
G. Division 28 – All sections

1.03 REFERENCES
A. Use date of standard or code in effect as of Bid date.
B. State and Local Codes including Authority Having Jurisdiction
C. UL - Underwriters Laboratories
D. ADA – Americans with Disabilities Act
E. NFPA 70 National Electric Code

1.04 QUALITY ASSURANCE
A. Requirements of Regulatory Agencies:
   1. Furnish security equipment to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.
   2. Furnish security equipment to comply with the requirements of American National Standards for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People (ICC/ANSI A117.1), the
governmental authority having jurisdiction and to comply with Americans with Disabilities Act.

B. Pre-qualified Access Control Integrators.
   1. Equipment manufacturer certified installers shall be used to complete this work to protect the district’s interest and keep the equipment warranty valid. A list of vendors with who we have had successful experience with recent projects is available upon request from the DPS project manager.

C. Pre-Installation Conference: Prior to installation arrange conference between supplier, and all Division 08 contractors, electrical contractor, General Contractor, Architect and necessary personal from DPS to review materials, procedures, and coordinating related work.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Acceptance: Upon delivery to the site, Contractor shall inspect all products and materials for any damage. Acceptance of the units constitutes that the inspection has occurred and no damaged or unacceptable products were found, and any damage or unacceptable products would be the responsibility of the Contractor.

B. Product Storage and Handling Requirements
   1. Open each container; verify contents against packing list, and file copy of packing list, complete with container identification for inclusion in operation and maintenance data.
   2. Save original manufacturer’s containers and packing materials and deliver as directed under provisions covering extra materials.
   3. Provide secure lock-up for material delivered to the Project, but not yet installed. Control handling and installation of items that are not immediately replaceable so that completion of work will not be delayed by losses both before and after installation.

1.06 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer’s absolute limits.

1.07 COORDINATION

A. Coordinate work of this Section with other directly affected Sections as well as Electrical Engineer, Electrical Contractor, and General Contractor for location of conduit and .and electrical boxes.

B. See Section 087100 Door Hardware for operational description and locations of electrified door hardware. Coordinate with automatic operators as required by DPS.

C. Conduit and raceways as needed for electrical hardware items. Fire/life-safety system interfacing. Point-to-point wiring diagrams plus riser diagrams to related trades.

D. Contractor shall obtain from General Contractor or DPS any areas of asbestos within the School of which they are working.

1.08 EXTRA MATERIALS

A. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.

B. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.

C. Contractor shall coordinate with DPS Security Department additional material required prior to receipt of bids.

1.09 PRECEDENCE

A. Obtain, read and comply with General Conditions and applicable sub-sections of the contract specifications. Where a discrepancy may exist between any applicable sub-section and directions as contained herein, this section shall govern.

1.10 GENERAL CONDITIONS

A. In accordance with Section 28 05 00, Security System General Requirements
1.11 APPLICABLE PUBLICATIONS
   A. In accordance with Section 28 05 00, Security System General Requirements

1.12 SHOP DRAWINGS & EQUIPMENT SUBMITTAL
   A. In accordance with Section 28 05 00, Security System General Requirements

1.13 OPERATING AND MAINTENANCE MANUALS
   A. In accordance with Section 28 05 00, Security System General Requirements.

1.14 SERVICE AND MAINTENANCE
   A. In accordance with Section 28 05 00, Security System General Requirements

1.15 TRAINING
   A. In accordance with Section 28 05 00, Security System General Requirements

1.16 WARRANTY
   A. In accordance with Section 28 05 00, Security System General Requirements

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. Access Control System Hardware/Firmware/Software:
      1. Open Options, Inc. DNAFusion Security Management System

2.02 MATERIALS, GENERAL
   A. Power: All access control equipment shall operate on PoE (IEEE Compliant 802.af). Any special power treatment required, such as filtering or spike elimination that may be required for proper operation and protection of the system shall be provided as part of the system.
   B. Hardware: Provide a distributed access control system as required for a complete operating system as described herein and as shown on the Drawings.

2.03 SYSTEM PROGRAMMING
   A. The contractor shall furnish and install all hardware, software (at DPS discretion), devices and components to meet the performance and functional requirements described in these contract documents. Include all items required, whether or not individually specified, to ensure a completely operational integrated Security Protection system. DPS Security Department shall complete all cardholder entry. Contractor shall provide all system programming.

2.04 SYSTEM CAPABILITIES
   A. General:
      1. The access control system software shall serve as a database manager, controlling badge data, access rights, time schedules, multiple operation modes, visitor sign-in/sign-out and access privileges and alarm point information. Database changes shall be updated or downloaded automatically from the system server to the field panels. The system server shall determine which changes are to be downloaded to which field panels.
      2. All databases should have the ability to add, delete, report, view and edit information.
      3. The system shall provide storage of all system transactions in a retrievable file.
      4. Log all events by time and date.
      5. After the installation, DPS shall be able to perform hardware configuration changes. These hardware configuration changes shall include, but not limited to door open time, door contact shunt time, contact point and reader names, when and where a cardholder is valid and the ability to add or modify card database as desired without the service of the contractor or the manufacturer.
6. The software shall use drop-down menus for all previously entered system-required data.
7. The system shall offer ‘lock-down’ capability in which the user can lock (or change the state of) all doors simultaneously with one single mouse click.
8. The system shall provide mode of system operation that requires the operator to enter a response to an event when acknowledging it.
9. The system shall provide a hierarchical structure of alarm set up and acknowledgement that allows acknowledged alarms to be automatically cleared.
10. The system shall provide a mode of operation where unacknowledged alarms can be re-routed to different groups of workstations.
11. The system shall provide a mode of operation that does not allow the operator to clear an alarm prior to being restored to normal.
12. The system shall provide ability to manually operate the system doors. The manual functions include the ability to Lock, Un-Lock, Shunt, Un-Shunt and Return to Time Zone.

2.05 SYSTEM COMPONENTS

A. Software and Server Package
   1. Software shall be provided by DPS. Additional user licenses may be needed, provided by contractor.
B. Server shall be provided by DPS.
C. Door Hardware – Reference Section 087100, Door Hardware and Electronic Access Control – Intrusion map for locations of electrified hardware. Division 280000 Contractor shall provide templates to aluminum door and frame, hollow metal door and frame and wood door suppliers.
   1. Access Control Cylindrical Locksets:
      a) Complete monitoring of lock at door.
      b) Lever Trim: All lever trim shall have “clutching” function to prevent vandalism or damage. All lever trim shall have individual heavy-duty springs for lever return and to prevent sagging. All lever trim shall be cast, forged or wrought.
      c) Locking device with integral card reader shall be available in proximity technology.
      d) Locking device with integral proximity reader must function with either cards or fobs.
      e) Chassis: Brass or cold-formed steel, zinc plated and dichromate for rust resistance. Springs are stainless steel. Non-handed.
      f) Latchbolts: ½” projection, ¾ where required by code.
      g) Strikes: 16 gauge curved steel, bronze or brass with 1” deep box construction, lips of sufficient length to clear trim and protect clothing.
      h) Lockset shall be modular design for future upgrade to Smart Card technology.
         i) Keying and installation of cylinders is the responsibility of the 087100 contractor. Keying information shall be provided by DPS.
      i) Certifications:
         i) ANSI A156.2 and ANSI A156.25, Series 4000 Grade 1 Strength and Operational.
      j) Low voltage, 12, 24Volt or PoE (IEEE Compliant 802.af), UL listed for fire doors up to 3 hours and FCC certified.
   2. Access Control Exit Trim:
      a) Exit trim shall be determined by DPS Security Department or Lock shop
      b) Complete monitoring of lock at door.
c) Locking trim with integral multi-tech reader card reader must function with either cards or fobs.
d) Lever Trim: All lever trim shall have “clutching” function to prevent vandalism or damage. All lever trim shall have individual heavy-duty springs for lever return and to prevent sagging. All lever trim shall be cast, forged or wrought.
e) Scheduled Series and Design: Series to be determined by DPS Security Department or Lock shop

3. Electric Latch Retraction Panic Hardware
   a) Precision 2100 series – as determined by Security Department.
   b) Electric Latch Retraction Panic Hardware Power Supply.
      i. Precision ELR150 series.

4. Electric Power Transfer
   a) Precision EPT-5.

5. Electric Strikes
   a) Rutherford Controls RCI0162, RCI0162LM, or HES1006.

6. Electric Strike and Receiver Power Supply, (if fail safe – connecting to fire panel)
   a) LifeSafety Power FPO100/200-E2, or,
   b) Altronix AL400ULX, or,
   c) Lifetime Series Pro FPX200A/100-A8D8E2.

D. Hardware
1. All the hardware shall be provided with enclosures, which have hinged doors and locks.
2. Reader Controller
   a) The reader controllers shall be independently programmed, intelligent devices, which shall be able to make decisions at the local level. The system shall provide reader controllers at 16 reader capacity or more.
      i. 16 door controller: Mercury Platform EP1501 or Open Options DCONTROLLER.
   b) Reader Panel Enclosure
      i. LifeSafety Power E5M, or,
      ii. Hoffman A8N84 8”x8” hinged enclosure with Hoffman A8AnPP perforated panel and Hoffman AL12AR enclosure cylinder lock kit.
3. I/O expansion board – if required
   a) The I/O expansion board has on board capacity of (8) 1A relays and (8) Analog Inputs (supervised or non-supervised).
   b) Open Options ISC-16 and OSC-16 (furnish less box if required)
4. Reader Interface
   a) Each reader in the system shall have a dedicated reader interface: Mercury Platform, 1-door controller MR51e or Open Options NSC-100.
   b) Reader Operation
      i. Door lock shall automatically lock upon the door being opened.
      ii. Automatically locking of the door lock after the door being opened will be delayed for a user defined time period.
   c) Reader Panel Enclosure
i. LifeSafety Power E5M enclosure, or,
ii. Hoffman A8N84 8”x8” hinged enclosure with Hoffman A8AnPP perforated panel and Hoffman AL12AR lock.

5. Card Reader
   a) HiD Smart Card Reader iClass SE R10, 900NNNEK2037P
   b) HiD Smart Card Reader/Keypad iClass SE R40 (Elevator User), 921NTNNEK0000

6. Credentials:
   a) Key Card: HiD Smart Cards iClass SE, Part# 3050PGGMN, FORMAT H10302, Quantity 300. Programming of Key Card by DPS.
   b) Proximity Key FOB: HiD iClass SE, Quantity 100. Part # 3250PNNMN, Format H10302, Programming of Fob’s by DPS.

7. Request to Exit (REX) Devices
   a) The REX shall be a dual technology device with Passive Infrared (PIR) and Range-Controlled Radar (RCR) motion detector.
   b) Provide GE/Interlogix RCR-REX-W

8. Credentials:
   a) Key Card: HiD Smart Cards iClass SE, Part# 3050PGGMN, FORMAT H10302, Quantity 300. Programming of Key Card by DPS.
   b) Proximity Key FOB: HiD iClass SE, Quantity 100. Part # 3250PNNMN, Format H10302, Programming of Fob’s by DPS.

E. Cables
   a) Provide cabling per manufacturer’s recommendations and code requirements for riser rated, plenum, and non-plenum cable types.
   b) UTP data cabling will be provided, installed, terminated and tested by the Division 27 structured cabling contractor.
   c) UTP patch cables will be provided and installed by the contractor in the IDF and at the door.
   d) Provide 6-conductor 22awg shielded cable from single door controller to card reader.
   e) Provide 2-conductor 22awg cables from single door controller to door contact switch and request to exit device.
   f) Provide a minimum of a 2-conductor 18awg cable from single door controller or power supply to electric strike, latch or panic. The contractor shall size the cable as required for the distance and inrush current load as required.

PART 3 - EXECUTION

3.01 GENERAL
   A. In accordance with Section 28 05 00, Access Control General Requirements. Site Verification of Conditions

3.02 PREPARATION
   A. Door and Frame Manufacturer(s) shall prepare doors and frames for electronic hardware furnished by Division 087100 Door Hardware Contractor or Division 280000 Contractor.
   B. General Contractor or Electrical Contractor to furnish any inserts required for building into concrete, masonry, and other work, to support and attach work of this section. Furnish in ample time to comply with schedule of work into which inserts are built.
   C. Verify that power and outlets are in correct locations.
D. Verify that doors and frames have been prepared for items specified in section 087100 Door Hardware.

E. Verify that building structure is properly prepared for mounting, attachment and support of equipment.

F. Prior to installation of systems components and devices, verify all required preparations have been properly performed and that substrates are acceptable for installation.
   1. Verify all rough-ins and field dimensions.

G. Report in writing to the Architect any prevailing conditions that will adversely affect satisfactory execution of Work in this Section.
   1. Architect or DPS Security Department reserves the right to review proposed methods of construction/installation, reject proposed methods, and require the installation done in a satisfactory method.

3.03 INSTALLATION OF SYSTEM

A. Install work in accordance with manufacturer's recommendations, instructions and final Shop Drawings marked as approved.

B. Wherever cutting and fitting are required to install hardware on surfaces which are to be painted or finished by others, coordinate removal, storage, and reinstallation or application of surface protections with finishing work specified in other Sections. Do not install surface-mounted items until finishes have been completed on the substrate. NOTE: NO POWER DRIVEN TOOLS SHALL BE USED FOR INSTALLATION OF LOCKSETS AND HARDWARE ON DOORS.

C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as required for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with referenced standards.

E. Drill pilot holes for fasteners in wood doors and/or frames.

F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with DPS Security Department.
   1. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

G. Anchor components securely in place, plumb, level, and accurately aligned. Provide separators and isolators to prevent corrosion and electrolytic deterioration.

H. For card readers that are located in equipment traffic areas, and that are exposed to damage due to collision or impact from manually moved carts, carriers, or other equipment used by DPS, provide protective bollards, railings, coverings etc. to ensure that all card readers installed are properly protected from such damage.

I. Provide fastenings, plates, and other incidental items required for complete and operational installation.

J. Install Door hardware including locksets and exit trim. Install the electric latch retraction panic hardware and associated power supplies. Install the electric strikes and associated power supplies.

K. Contractor shall install an on/off switch next to the latch retraction panic hardware power supply and the automatic operator control box.

L. Contractor shall terminate all wiring to automatic operator actuators.

M. After installation of all exit devices, General Contractor to have Manufacturer’s representative inspect installation. Representative shall submit a written report to the Architect with copies to the General Contractor and hardware supplier upon completion of service. This report shall include any installation errors, noting which door and specific details of the error.

N. Adjust and check each operating hardware item, and each door assembly to ensure proper operation and function. Lubricate moving parts with lubrication type recommended by manufacturer.
1. Replace units, which cannot be adjusted and lubricated to operate freely and smoothly.
2. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner’s satisfaction.

3.04 SPECIAL INSTRUCTIONS

A. Door Hardware Coordination
B. Access Control and Lock Configuration
C. Sequences: Verify each door type sequence at each door with the Owner.
D. Tamper Devices
E. Elevator Work
F. Graphical User Interface (GUI) Environment
G. EACS Connectivity
H. Emergency Standby Power

3.05 ACCESS CONTROL SYSTEM INTEGRATION

A. Provide access control system integration equipment, software and programming, in accordance with Section 28 07 00, Access Control System Integration. In addition provide specific integration schemes noted EACS Video Integration
B. EACS EMERGENCY PHONE INTEGRATION
C. EACS INTERCOM SYSTEM Integration

3.06 EQUIPMENT, RACK AND CONSOLE INSTALLATION

A. Mount equipment in rooms, consoles, equipment racks, and desktops in accordance with Section 28 05 00, Security System General Requirements.

3.07 GROUNDING PROCEDURES

A. Provide grounding of all systems and equipment in accordance with Section 28 05 00, Security System General Requirements.

3.08 WIRE AND CABLE INSTALLATION PRACTICES

A. Provide wire and cable installation in accordance with Section 28 05 00, Security System General Requirements.

3.09 DATABASE PREPARATION, CHECKING AND ACTIVATION

A. Provide database preparation, checking and activation for systems and equipment in accordance with Security System General Requirements, Section 28 05 00.

3.10 START-UP RESPONSIBILITY
A. Provide start-up services for all systems and equipment in accordance with Security System General Requirements, Section 28 05 00.

3.11 PRELIMINARY INSPECTION AND TESTING
A. Provide preliminary inspection and testing services for systems and equipment in accordance with Testing and Commissioning, Section 28 08 00.

3.12 SYSTEM PERFORMANCE TESTING AND ADJUSTING PROCEDURES
A. Provide performance testing and adjusting of systems and equipment in accordance with Testing and Commissioning, Section 28 08 00.

3.13 BURN-IN PERFORMANCE PERIOD
A. Provide a burn-in performance period to demonstrate the stability of the system, in accordance with Testing and Commissioning, Section 28 08 00.

3.14 COMMISSIONING AND VALIDATION
A. Provide commissioning and validation services to prove and improve the effectiveness of the system, in accordance with Testing and Commissioning, Section 28 08 00.

3.15 FINAL PROCEDURES
A. Perform final procedures in accordance with section 28 05 00, access control general requirements.
PART 4.0 – EQUIPMENT SCHEDULE

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<th>Part Number</th>
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PART 5.0 – ONE LINE DRAWINGS

A. 28 13 00-1 Access Control Dbl Door One Line Diagram

END OF SECTION 28 13 00