

SECTION 28 13 00 – ACCESS CONTROL SYSTEMS (ACSs)

1.01 SUMMARY:

- A. ^{A17}**Scope:** Scope of work shall be in accordance with Paragraph 1.01 D. of Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), as required for physical security in the [Works](#).^{A17} This Section of the Employer's Requirements shall be read in conjunction with the Sections listed in Table 28 13 00-1.
- B. **Related Sections:**

TABLE 28 13 00-1: ^{A9} Related Sections ^{A9}			
1.	Section 01 81 26	-	Communications, Control, Safety, and Security Systems.
2.	Section 01 81 36	-	Operations and Maintenance Buildings and Facilities – Program.
3.	Section 01 83 00	-	Facility Shell Performance Requirements.
4.	Section 01 84 00	-	Facility Interior Performance Requirements.
5.	Section 01 87 00	-	Equipment and Furnishings (ref. turnstiles).
6.	Section 25 11 00	-	Data Processing Equipment (DPE).
7.	Section 26 33 00	-	Direct Current Equipment.
8.	Section 26 43 13	-	Transient Voltage Surge Suppressors.
9.	Section 27 10 00	-	Structured Cabling System for Communications Inside Plant.
10.	Section 27 21 00	-	Data Communications Equipment (DCE).
11.	Section 28 13 53	-	Security Access Detectors.
12.	Section 28 16 00	-	Intrusion Detection Systems (IDSs).
13.	Section 28 16 46	-	Vehicular Control System.
14.	Section 28 23 00	-	Closed Circuit Video Systems (CCVSs).
15.	Section 28 23 19	-	Video Recording Systems (VRSs).
16.	Section 28 50 00	-	Evacuation Systems.
17.	Section 28 60 00	-	Attendance Control Systems.
18.	Section 48 19 16	-	Inverters.

1.02 REFERENCE:

- A. **Applicable Publications:** Refer to Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), ^{A9}Paragraph ^{A9} 1.02.
- B. **Background Information:**
1. **Proximity Cards:** The Employer will furnish cards as follows:
 - a. Cards shall be contactless and smart, and shall comply with one or more of the following standards for Personal Identity Verification (PIV): ISO 14443A, ISO 15693, and NIST FIPS 201.

- b. Cards shall include approximately four hundred (400) for Atlantic and four hundred (400) for Pacific Locks Complexes. These include cards for employees and temporary visitors.

1.03 REQUIREMENTS:

A. General Requirements:

1. General:

- a. ^{A17}The Contractor shall meet all applicable requirements of Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.03.^{A17}
- b. ACSs shall be furnished in accordance with Section 01 83 00 (*Facility Shell Performance Requirements*) and 01 84 00 (*Facility Interior Performance Requirements*), and as specified herein.
- c. Equipment capacity shall allow growth of future security needs in the third set of locks [complexes](#).

- 2. **Cabling:** Data cabling shall be in accordance with Section 27 10 00 (*Structured Cabling Systems for Communications Inside Plant*).

- 3. **Design:** The design shall be presented in an Installation Design Package (IDP), for review the Employer's Representative with participation of OPP's Physical Security Project Execution Team before procurement and installation of equipment starts.

4. Interoperability and Coordination:

- a. ACS equipment shall interface and integrate with the existing Employer wide Centralized Security Control System (CSCS) ^{A9}at Corozal West, Building 741 and Gatun, Building 40.^{A9} Specific programming needs will be confirmed by the Employer's Representative once hardware installation work starts.
- b. Provision of physical security equipment infrastructure shall be capable of supporting the new additional hardware and software upgrades of upcoming security developments.
- c. In addition to exit pushbuttons, presence detectors, and push bars, ACSs shall interact with fire alarm systems to release exit doors upon fire alarm.
- d. ACSs shall interoperate with the following:
 - 1) Evacuation systems, ref. Section 28 50 00 (*Evacuation Systems*).
 - 2) Attendance systems, ref. Section 28 60 00 (*Attendance Control Systems*).

- 3) CCVSs, ref. Section 28 23 00 (*Closed Circuit Video Systems*).
 - 4) Turnstiles or roto-gates, ref. Section 01 87 00 (*Equipment and Furnishings*).
 - 5) Proximity cards in use by the Employer at the time of the installation.
5. **Surveys:** ^{A17}The Contractor shall conduct site surveys and meet with the Employer's OPP Plans and Operations manager and Security Specialists to clear up or resolve questions, concept of proposed security setups to finalize the security design. ^{A17}

B. Equipment and Materials:

1. General:

- a. ACS components such as controllers, single or dual door readers, input/output modules, firmware chips, memory chips and biometric readers' interfaces shall be mechanically and electronically compatible with existing Employer's ACS Lenel OnGuard PROI, or approved equivalent updated version of the software as required by the Employer at the time of contracted installation.
- b. All biometric and card readers provided by the contractor shall be compatible to all units used or planned by the Employer at the time of contracted installation.
- c. Within the provisions, the contractor shall include all necessary software licenses for supporting the addition of all new biometric and cards readers to existing Employer's Lenel OnGuard ACS.
- d. ^{A9} (Reserved) ^{A9}

2. **Batteries:** ^{A19}Unless ACSs are powered by UPSs or DC power systems of Section 26 33 00 (*Direct Current Equipment*), the contractor shall provide rechargeable 12 VDC batteries with 7 Ah or larger capacity. ^{A19}

3. Biometric Readers:

- a. Units shall use a combination of three factors for authentication: Proximity card, fingerprint sensor, and PIN pad.
- b. Units shall have a compact, vandal resistant design suitable for indoor and outdoor installation, and audiovisual reader status indicators. Fingerprint sensor surface shall be protected by an ultra-hard, abrasion and chemical resistant coating.
- c. Units shall support standard Wiegand format, ^{A10}TIA 232/485, ^{A10} and Ethernet communications, and be operable on 12 VDC.

- d. ^{A9}Biometric readers shall be fully compatible with existing Bioscrypt finger prints database. ^{A9}
 - e. ^{A9} (Reserved) ^{A9}
- 4. **Cabling:** Unless otherwise recommended by the contractor and reviewed by the Employer,
 - a. Power cables for 24 volts or less shall be one twisted pair #18 AWG.
 - b. Signal cables between controller and card readers shall be one twisted pair #24 AWG.
- 5. **Card Readers:**
 - a. Readers shall be proximity type and UL 294 listed.
 - b. Units shall be tamperproof, capable of reading cards 76 mm (3”) or farther away, with black finish.
 - c. ^{A9} (Reserved) ^{A9}
- 6. **Conduits:** Shall be in accordance with Section 26 20 00 (*Electrical Low Voltage Distribution Work*).
- 7. **Controllers:**
 - a. Units shall be Physical Access Control Terminals (PACTs) with LAN connectivity. Access level permissions, event memory battery, grouping, and on-board memory size shall be as required.
 - b. Controllers shall support card and asset formats, and biometric devices as required, and be UL 294 or UL 1076 listed.
 - c. ^{A9}Units shall have 7 MB or larger memory, as required. ^{A9}
- 8. **Door Locks:**
 - a. Locks shall be electromagnetic, operable on 12 VDC, and capable of holding forces of 544 kg (1,200 lb).
 - b. Units shall have positive fail-safe/fail-secure security.
- 9. **Electric Strikes:**
 - a. Units shall be operable on 12 VDC.
 - b. Wherever exit bars are used for doors with ACS, the strike shall be the mating part recommended by the exit device manufacturer for the specific application.

10. **Enclosures:** Shall be sized and ventilated as required, and shall include power supply.
11. **End of Line (EOL) Resistors:** Shall be as recommended by the ACS manufacturer.
12. **Exit Bars:**
 - a. Bars shall be stainless steel, UL certified, and of tough, durable design for years of trouble-free service in high use environments.
 - b. Units shall have a RIM type exit actuator.
13. **Exit Pushbuttons:**
 - a. Units shall have stainless-steel plate.
14. **Junction Boxes:** Shall be in accordance with Section 26 20 00 (*Electrical Low Voltage Distribution Work*).
15. **Magnetic Contacts:** Shall be in accordance with Section 28 16 00 (*Intrusion Detection Systems*).
16. **Power Supplies:**
 - a. Units shall have voltage output and the required ampere capacity.
 - b. Power supplies shall be UL 294 or 1076 approved, and UL 294 listed.
 - c. Power supplies for EM locks and door strikes shall be different from power supplies for controller, readers, and I/O boards.
17. **Power Wiring:**
 - a. AC wiring shall be in accordance with Section 26 20 00 (*Electrical Low Voltage Distribution Work*).
18. **Presence Detectors:** Shall be infrared type, and shall automatically send a request to exit signal upon detection of the presence of a human.
19. **REX Detectors:**
 - a. Units shall be passive infrared (PIR) type, and shall automatically send a REX signal to the ACS controller to release an exit door.
 - b. Units shall have X-Y targeting adjustment for a specific detection area, DSP sampling to prevent “Door Forced Open” alarms, and an adjustable Main Relay Timer.
20. **Workstations:** Units for face recognition and other functions shall be in accordance with Section 25 11 00 (*Data Processing Equipment*).

- C. ^{A16}**Software:** Shall be furnished as required to meet the Employer's Requirements. ^{A16}
- D. **Installation:**
1. **General:** All 120 VAC power outlets for ACS equipment and components shall be provisioned with backup power sources to permit continuous operation of all ACS equipment. Other acceptable way to feed ACSs is using +125 VDC to 120 VAC inverters in accordance with Section 48 19 16 (*Inverters*).
 2. **Batteries:** Shall be installed according to the applicable power supply requirements and a minimum of two hours of backup.
 3. **Card Readers:**
 - a. Readers shall be installed inside ACS enclosures located in rooms in accordance with the Employer's Representative approved installation design.
 - b. ^{A19}Units for locks facilities shall be provided for all battery rooms (main control buildings), CCSS equipment rooms, Crossunder elevator rooms, electrical rooms, emergency evacuation designated meeting points, facility entrances and exits, fire-fighting equipment rooms, machinery rooms, personnel buildings, security guard booths and houses, value/storage rooms, and other defined critical rooms. ^{A19} ACS is not required at the Visitors Centers, Spares Storage Buildings, the Wastewater Treatment Plants, the Oil Spill Control Rooms, Air Compressor Rooms, Maintenance Building main entrance, Generator Room, Janitor Rooms, or the Personnel Break Rooms.
 - c. (Deleted)
 - d. Each turnstile or roto-gate, ref. Section 01 87 00 (*Equipment and Furnishings*) shall be provisioned with access card readers in order to control entry and egress flows of employees. Card readers shall be located immediately before each rotating gate, inside and outside the perimeter fence as required. All outdoors installed access card readers shall be provisioned with gray enameled 3.2 mm (1/8") aluminum made protecting covers to withstand environmental conditions. An additional access card reader shall be installed on the outside wall of each guard house and specified guard booths for the purpose of controlling visitors' entry to the protected facility by guard force.
 4. **Conduits:** ^{A17}Unless otherwise recommended by the Contractor and reviewed by the Employer's Representative, ^{A17}
 - a. All cable runs for ACS equipment, readers, magnetic or electric door locks shall be installed in electrical metallic conduits used for ACS system only.
 - b. All electrical metallic conduits shall be embedded inside concrete walls.

- c. 12 mm (1/2") conduit runs shall provide connectivity between junction boxes for door readers, presence detectors, exit pushbuttons, and magnetic door locks or door strikes.
- d. All conduit runs between main equipment enclosure and exit pushbutton junction boxes shall be 19 mm (3/4").
- 5. **Controllers:** Unless otherwise notified by the Employer's Representative, each building facility shall be provided with an independent ACS intelligent controller. Controllers shall be connected to Employer intranet.
- 6. **Door Locks:** Except for light doors equipped with door strikes, door locks shall be provided for all locations with access control card readers.
- 7. **Electric Strikes:** Can be used for light duty, small doors instead of magnetic door locks.
- 8. **Enclosures:** Units shall be installed in rooms in accordance with the Employer's Representative approved installation design.
- 9. **End of Line (EOL) Resistors:** Shall be installed for all magnetic door contacts and supervised lines installed for access control.
- 10. **Exit Bars:** Shall be surface mounted and easily accessible, installed at LMCS control rooms and other spaces as required by NFPA 101.
- 11. **Exit Pushbuttons:** Shall be provided for all locations with magnetic door locks.
- 12. **Fingerprint Readers:** Shall be provided for main control building entrances.
- 13. **Magnetic Door Contacts:** Shall be furnished for all doors with ACS card reader.
- 14. **REX Detectors:** Shall be provided for locations with magnetic door locks.

1.04 DESIGN CRITERIA/SYSTEM PERFORMANCE:

A. General:

- 1. **Problem to be Solved:** ACSs shall solve the following business needs:
 - a. Restrict and allow entrance to a building, property, room, and other spaces, as required for [locks operation](#).
 - ^{A16}b. Transmit data to the Employer's CSCSs in Corozal West 741 and Gatun 40 as required, including access control transactions and alarms associated to ACS controllers.^{A16}

2. **Restrictions to be Considered:**

- a. Prescriptive information is given in order to meet OPP standards.
- b. Equipment shall be from sole source ^{A9} (refer to Subparagraph 1.03 B.1.)^{A9} or fully compatible with make and model of existing Employer ACSs in use at the time of installation.
- c. Proximity cards will be furnished by the Employer.

B. **Design Criteria:**

1. ^{A19}Design shall meet the requirements of ASIS guidelines, IMO ISPS, NIST FIPS 201, NPFA 101 and either the U.S. DOL Americans with Disabilities Act or Panama Law 42.^{A19}
2. Depending on ACS design, +24 VDC may be required from the systems of Section 26 33 00 (*Direct Current Equipment*).

C. **System Performance:**

1. **Access Control:**

- a. ACSs shall manage access to locations in the third set of locks **areas, and** produce comprehensive audit logs for all access points. ACSs shall only allow access to personnel possessing and presenting an authorized access card and valid finger print (where equipped with biometric device) at designated entry points.
- b. ACSs shall have anti-passback capabilities. ^{A17}For a given door, this requires reader inside and outside.^{A17}
- c. Exit devices shall allow free egress at all times while maintaining control of ingress. Request to exit an area shall be automatic upon detection by REX detector, and manual upon pushing an exit pushbutton or push bar.
- d. ^{A10}ACSs shall furnish means for technicians to connect remotely for maintenance and programming purposes.^{A10}

1.05 SUBMITTALS: The following shall be submitted for substantiation purposes:

- A. **Design:** The following shall be in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), ^{A9}Subparagraph 1.05 D:^{A9}
 1. Block diagram for hardware.
 2. Calculations, including system availability.
 3. CPM diagram, with monthly updates.
 4. Descriptive literature.
 5. Drawings.

6. ^{A19}Protection methods for corrosion, ESD, fungus/humidity, lightning/surge, power distortion and harmonics, radio-frequency interference/electromagnetic interference (RFI/EMI), thermal, and vibration. ^{A19}
 7. Quality assurance and control plans.
 8. Security risk analysis.
 9. Specifications.
 10. SWOT analysis.
 11. Any other data required for review.
- B. **Re-submittals Just Prior to Purchasing Materials:** All items in A. above that have changed from original submittal shall be resubmitted in a Design Conference in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.05.
- C. **Upon Receipt of Shipped Items in Panama:**
1. Instruction manuals for administration, installation, maintenance, and operation.
 2. Packing lists.
- D. **Prior to Issuance of Taking Over Certificate:**
1. As-built drawings.
 2. List of recommended spare parts.
 3. Software licenses.
 4. Test reports.
- 1.06 QUALITY ASSURANCE:** Shall include the following in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.06:
- A. Factory Quality Control Tests (FQCT).
- B. Test Reports: Final Field Inspection Tests (FFIT).
- C. **Training Services:**
1. The Contractor shall provide factory direct training in Panama for no less than fourteen (14) Employer collaborators, pay for all of the expenses, ^{A9}and deliver the certificates for all attendees. ^{A9}
 2. ^{A9}Course contents shall be factory direct, ^{A9} coordinated and agreed with the Employer's OPP prior or during the installation process.
- D. Warranty.

END OF SECTION

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