

## SECTION 28 16 43 – PERIMETER SECURITY SYSTEMS (PSSs)

### 1.01 SUMMARY:

- A. <sup>A17</sup>**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 fence intrusion detection and physical security for the entire perimeter fences and all smaller areas surrounded with fences as part of the Works.<sup>A17</sup> This Section of the Employer's Requirements shall be read in conjunction with the <sup>A9</sup>Sections <sup>A9</sup> listed in Table 28 16 43-1.

B. **Related Sections:**

| TABLE 28 16 43-1: <sup>A9</sup> Related Sections <sup>A9</sup> |   |
|--|---|
| 1.   | Section 01 81 26 - Communications, Control, Safety, and Security Systems. |
| 2.   | Section 01 81 36 - O&M Buildings and Facilities – Program.                |
| 3.   | Section 01 81 36.13 - O&M Buildings and Facilities – Space Programming.   |
| 4.   | Section 01 89 16 - Site Construction.                                     |
| 5.   | Section 25 11 00 - Data Processing Equipment.                             |
| 6.   | Section 26 33 00 - Direct Current Equipment.                              |
| 7.   | Section 28 16 00 - Intrusion Detection Systems.                           |
| 8.   | Section 28 23 00 - Closed Circuit Video Systems.                          |

### 1.02 REFERENCE:

- A. **Applicable Publications:** Refer to Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.02.

### 1.03 REQUIREMENTS:

A. **General Requirements:**

1. The Contractor shall meet all applicable requirements of Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.03.
2. <sup>A9</sup> (Reserved) <sup>A9</sup>

B. **Equipment and Materials:**

1. **Annunciation Panels:**

- a. Annunciator panels shall be touch-sensitive terminals in accordance with Section 25 11 00 (*Data Processing Equipment*) with mimic display of the entire perimeter for local reporting of alarms per zone.
- b. Each panel shall provide audible and visual indication of every alarm activation.

- c. Alarm activations shall be received at the guard booth or guard house annunciator panel on the same side of the alarm zone.
2. **Conduits:** The Contractor shall provide underground and aerial electrical conduits as required for the installation.
3. **Control Panels:**
  - a. Panels shall have digital processing as required for alarm detection and audio-visual annunciation.
  - b. Control panels shall include processor modules, link units, isolated link units, splice units, terminating units, relay modules, network interface modules, data adapters, power supplies, and software as required.
  - c. Units shall provide power to remote sensors as required, and shall have connections to local annunciation panels and remote equipment <sup>A9</sup>at the Security Control Centers (SCCs) at Corozal West Building 741 and Gatun Building 40. <sup>A9</sup>
  - d. Multiple control panels shall be furnished on each locks side, should there be distance limitations.
  - e. <sup>A9</sup>Each panel shall be capable of having up to eight processor modules, each with up to 20 control segments. <sup>A9</sup>
4. **Data Processing Equipment:** If any, shall be in accordance with Section 25 11 00 (*Data Processing Equipment*).
5. **Tie Wraps:** Shall be sized as required and ultra-violet (UV) radiation resistant.
6. **Vibration Sensors:** Shall be based on a single cable <sup>A9</sup>, and shall detect disturbances within 3 meter or smaller zones along cable. <sup>A9</sup>

**C. Installation:**

1. **Annunciation Panels:**
  - a. PSSs shall have local annunciation in all “División de Protección y Respuesta a Emergencias” (OPP) guard booths and guard houses near east and west entrances to the new locks.
  - b. PSSs shall have remote annunciation in OPP’s SCC, using secure connections via Employer’s intranet.
2. **Control Panels:** Main units shall be installed in new guard houses that will connect to main roads and opposite to islands to be formed, that is, on the east side in the Atlantic locks complex and on the west side in the Pacific locks complex.
3. **Vibration Sensors:** Shall be installed along the inner side of the entire length of fences in the following:

- a. Locks perimeter,
- b. Water treatment plants (2 per locks complex estimated), and
- c. Any other small area surrounded by a fence.

#### **1.04 DESIGN CRITERIA/SYSTEM PERFORMANCE:**

##### **A. General:**

- 1. **Problem to be Solved:** PSSs shall solve the following business needs:
  - a. Provide the first layer of defense in physical security for the third set of locks perimeter fences.
  - b. Provide physical security for areas enclosed in fences, including wastewater treatment plants.
  - <sup>A16</sup>c. Transmit data to the Employer's CSCSs in Corozal West 741 and Gatun 40 as required, including alarm zone or point status, location, and activations.<sup>A16</sup>
- 2. **Restrictions to be Considered:**
  - a. Prescriptive information is given in order to meet the Employer's OPP standards.

##### **B. Design Criteria:**

- 1. Design shall be in accordance with the applicable ASIS guidelines.
- 2. Depending on PSS design, +24 VDC may be required from the systems of Section 26 33 00 (*Direct Current Equipment*).

##### **C. System Performance:**

- 1. PSSs shall detect when any person tries to cut or climb a fence in protected areas.
- 2. PSSs shall not have false alarms due to small animals, winds up to 70 km/h (43.5 mi/h), and wind speeds normally found throughout the year, especially in the dry season between January and March. Refer to Volume VI, Part 7 (Hydro-meteorological Report) for more information. The Employer finds acceptable having a shutdown alarm in zones where winds exceed the above limit, if reset is automatic when wind speed drops below such limit.
- 3. PSSs shall be capable of defining detection zones as small as 1 m long, discriminate events along the perimeter, and adjust sensitivity for each zone independently.
- 4. PSS's shall require electrical feeds from different locations along fence lines. All these feeds shall have an adequate backup to ensure continuous PSS operation at all times.

5. <sup>A9</sup>Each PSS shall be capable of up to 50 fence zones and up to 60 auxiliary sensors. <sup>A9</sup>

**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*), <sup>A9</sup>Subparagraph 1.05 D: <sup>A9</sup>
  1. Calculations, including distance limitations and system availability.
  2. Critical path method (CPM) diagram, with monthly updates.
  3. Descriptive literature.
  4. Drawings.
  5. Protection methods for corrosion, electrostatic discharge (ESD), fungus/humidity, lightning/surge, power distortion and harmonics, radio frequency interference / electromagnetic interference (RFI/EMI), thermal, and vibration.
  6. Quality assurance and control plans.
  7. Specifications.
  8. Strengths, weaknesses, opportunities, and threats (SWOT) analysis.
  9. Any other data required for review.
- B. **Re-submittals Just Prior to Purchasing Materials:** All items in subparagraph 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, installation CDs and passwords.
  4. Test reports.
  5. Training services’ details.

**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. Training Services for no less than eight persons from Employer's Personnel.
- C. Final field inspection tests (FFIT).
- D. Warranty.

**END OF SECTION**

<sup>A16</sup>**THIS PAGE NOT USED**<sup>A16</sup>