SECTION 281606
PERIMETER ALARM MONITORING AND INGROUND DETECTION SYSTEM

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Microwave Detection System: Section 281603.

B. Closed Circuit Television System: Section 282301.

1.02 SYSTEM DESCRIPTION

A. The perimeter alarm monitoring and inground detection system shall operate as follows:
1. A person moving in the area between the perimeter fences creates disturbances in an electro-magnetic surface wave which propagates along 2 parallel buried “leaky coaxial” sensor cables.
2. Sensor cables are connected to Transceiver Modules (TM) which generate the electromagnetic wave and also evaluate disturbances in wave to determine if alarm condition is present.
3. Each TM communicates the status of monitored zones with a Control Module (CM) in the security console via the inground sensor cables.
   a. Each TM monitors 2 inground sensor zones.
   b. Designated TM’s monitor the following remote sensors as indicated in the Perimeter Alarm Schedule on the Drawings:
      1) Tamper switches in Camera Control Cabinets.
      2) Tamper switches in Microwave Receivers and Transmitters.
      3) Alarm contacts in Microwave Receivers.
   c. TM’s receive commands from the Control Module and Operator’s Terminal (OT) in the security console and activate control functions at remote locations as follows:
      1) Remote test of individual inground sensor zones.
      2) Remote test of individual microwave zones.
   d. Tampering with TM units generates a unique alarm at the Operator’s Terminal.
   e. TM’s provide 12 volt DC power output for powering the following auxiliary equipment connected to the TM:
      1) Microwave Transmitters and Receivers.
   4. An Operator’s Terminal (OT) located in the security console is equipped with a high resolution color graphic video display (cathode ray tube), special operator control keys, and a full alphanumeric keyboard (in locked cabinet) which allows the operator to monitor system status and activate control functions as follows:
      a. Alphanumeric keyboard allows authorized personnel to completely program the system, including the following:
         1) Changing map display.
2) Adding and deleting sensor inputs and control outputs.
3) Entering and changing operator instructions and prompting messages displayed on the video display during normal operation.

b. Special keys on the front panel allow the attendant to perform the following:
1) Acknowledge alarms.
2) Change individual zone status to access and secure modes.
3) Activate remote tests of each individual perimeter zone (inground sensor & microwave).

c. Color graphic video display, displays perimeter map, prompting messages, sensor status changes, date and time:
1) Changes in status of perimeter zones are indicated by changes in color on map display.
2) Changes in sensor status are also indicated by an audible alarm.

5. The system is equipped with a printer that prints a changes in zone status, zone tests, etc. (date and time of each change in status is also printed).

6. Upon receipt of an alarm condition, an Interface Unit (IU) connected between the Control Module and CCTV system central processing unit (TVCPU) enables the perimeter alarm monitoring system to automatically initiate switching of the CCTV camera covering the perimeter zone in alarm to a designated monitor in the security console and also activates the video cassette recorder (Section 282301).

7. All wiring between remote sensors, Transceiver Modules, and Control Module in security console is completely supervised.

1.03 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

C. Shop Drawings:
1. Bill of materials.
2. Wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted).
3. Interconnection details between the systems monitored and controlled by the perimeter alarm monitoring system.
4. Detailed description of system operation (format similar to DESCRIPTION OF SYSTEM).
5. Scale drawings of the security console showing location and mounting of components.
6. Scale drawing of the site plan showing proposed location of sensor cables.

D. Product Data:
1. Catalog sheets, specifications and installation instructions.
2. Name, address and telephone number of nearest fully equipped service organization.

E. Quality Control Submittals:
1. Installers’ Qualifications Data: Include the following for each person who will be performing the Work.
   a. Name.
   b. Employers name, business address and telephone number.
   c. Name and address of the required number of similar projects worked on which meet the experience criteria.
2. Company Field Advisor Data: Include:
   a. Name, business address and telephone number of Company Field Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.

F. Contract Closeout Submittals:
2. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
3. Operation and Maintenance Data: Deliver 2 copies to the Director’s Representative, covering the installed products. Include:
   a. Operation and maintenance data for each product.
   b. Complete point by point wiring diagrams of entire system. Number all conductors and show terminations and splices at transceiver modules, camera control cabinets, microwave units, and security console. (Numbers shall correspond to numbered tags installed on each conductor).
   c. Site drawing showing exact locations of inground sensor leading cables.
   d. Name, address, and telephone number of nearest fully equipped service organization.

1.04 QUALITY ASSURANCE

A. Installers’ Qualifications: The persons installing the Work of this Section and their supervisor shall be personally experienced in security systems and shall have been engaged in the installation of security systems for a minimum of three years.
1. Furnish to the Director the names and addresses of five similar projects which the foregoing people have worked on during the past three years.

B. Source Quality Control: The Company producing the system shall have test facilities available which can demonstrate that the proposed system meets contract requirements.
C. Equipment Qualifications For Products Other Than Those Specified:
1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.
   a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
   b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.
      1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
   a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.
4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

D. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 80 hours for the following:
1. Render advice regarding installation and final adjustment of the system.
2. Assist in initial programming of the system.
3. Witness final system test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
4. Train facility maintenance personnel in operation, programming and routine maintenance of the system (minimum of 16 hours).
5. Train facility security personnel in operation and programming of the system (minimum four 2 hour sessions).
6. Explain available service programs to facility supervisory personnel.

E. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed system.

PART 2 PRODUCTS

2.01 PERIMETER ALARM MONITORING AND INGROUND DETECTION SYSTEM

A. General: System shall be a Sentrax System as manufactured by:

    Senstar Inc.
    Box 800
    Brockton, MA 02402
    617-584-2784

B. System shall include the following equipment:

1. Operator Terminal (OT): Senstar Model OT1-1 complete with Color Graphic Video Display (Cathode Ray Tube) and full alphanumeric keyboard suitable for rack mounting in security console.

2. Control Model (CM): Senstar Model CM1-1 with all accessories required to operate and monitor all system functions in the event of failure of the Operator Terminal. (Suitable for rack mounting.)


4. Interface Unit (IU): Senstar Model IV01CTL with all circuit cards required for interfacing with CCTV system. (Suitable for rack mounting.)

5. Transceiver Modules (TM): Senstar Model TM1-1, with enclosure and mounting hardware suitable for attaching to perimeter fence.
   a. Equip each TM with input and output interface cards for monitoring auxiliary sensors (present and future) and controlling remote test functions (present and future).

6. Inground Service Cables: Senstar Series CS1 cable sets, complete with terminators, and decouples. “Non-leaky” lead-in sections are required.

C. Interconnection Cable:

1. Type MCC: Multiconductor cable with 6 individually shielded twisted pairs of insulated 20 AWG stranded copper wires enclosed in a jacket suitable for direct burial in earth: Beldon Corp. 9886.

D. Tags and Nameplates:


2. Nameplates: Phenolic engraved plates; minimum 3/4 inch wide and length as required for inscription as manufactured by Seton Nameplate Corp.
PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Perimeter Alarm Monitoring and Inground Detection System in accordance with the manufacturer’s instructions and interconnect with the Microwave Detection System (Section 281603) and the Closed Circuit Television System (Section 282301) for a complete integrated system.

1. Sensor cables shall be located in area between 16 feet and 8 feet perimeter fences. Locate cables as required to prevent a person from jumping undetected over the cables from the top of the 8 foot inside fence.

2. Complete installation, adjustment, and preliminary system testing prior to paving the surface above the sensor cables.

B. Make all cable connections, terminations, and splices (other than sensor cables) in microwave transmitter and receiver units, camera control cabinets, transceiver modules, and perimeter security console. Splices will not be permitted at any other locations.

1. Tag conductors at terminal strips, cabinets, and pullboxes (designations shall correspond with point to point wiring diagrams.)

2. Use Type MCC cable for connections between microwave units, camera control cabinets, and TM’s.

3.02 FIELD QUALITY CONTROL

A. Company Field Advisor shall witness installation of all buried sensor cable.

B. Preliminary System Test: (Prior to paving area between fences):

1. Preparation: Have Company Field Advisor adjust the completed system and then operate it long enough to assure that it is performing properly.

2. Run a preliminary test for the purpose of:
   a. Determining whether the system is in suitable condition to conduct final test prior to paving over cables.
   b. Checking and adjusting equipment.
   c. Training facility personnel.

3. Preliminary test shall include all items described under System Acceptance Test. All tests shall be witnessed by Director’s Representative and Company Field Advisor.

C. System Acceptance Test (after paving has been completed):

1. Notify the Director’s Representative at least three working days prior to the test so arrangements can be made to have Facility Representative witness the test.
2. Perform simulated escape attempts listed below at intervals within each zone unless otherwise directed (Director’s Representative shall select exact location and type of escape attempt or combination of attempts). Each escape attempt shall produce an alarm. If it does not, wait 30 seconds and repeat at the same location. If misses are repeated in the same location, the entire zone must be corrected and retested. The simulated escape attempts shall be performed by a person weighing 120 lbs or less. Provide safety equipment and take proper precautions when performing tests. Terminate each attempt upon detection.
   a. Walk Test: Walk slowly across detection zone perpendicular to the beam.
   b. Run Test: Run quickly across detection zone perpendicular to the beam.
   c. Crawl Test: Crawl as low as possible on hands and knees across detection zone perpendicular to the beam.
   d. Belly Crawl: Crawl on stomach across detection zone perpendicular to beam (2 to 3 inches per second).

3. Where microwave zones overlap inground sensor zones, detection of the escape attempt may be by either the microwave zone or the inground sensor zone. Test results shall demonstrate that every attempt to cross the area between the 16 foot and the 8 foot fences shall be detected and produce an alarm.

4. Test each function summarized in SYSTEM DESCRIPTION.

5. Map out extent of detection area within each zone.

6. Include drawings showing the exact location (actual) of the buried sensor cables.

7. Include the following on the test form:
   a. Settings of all system and TM adjustments (sensitivity settings shall be adjusted to minimize nuisance alarms from birds, animals, weather conditions, etc., yet assure detection of 99 percent of all escape attempts.

8. Supply all equipment necessary for system adjustment and testing.

9. Submit a written report of test results signed by the Company Field Advisor and Director’s Representative.

END OF SECTION