SECTION 281605 - SENSOR CABLE DETECTION SYSTEM

Use this section in conjunction with section 281603.

1. GENERAL
	* + 1. RELATED WORK SPECIFIED ELSEWHERE
				1. Perimeter Security Multiplex System: Section 281603.
			2. SYSTEM DESCRIPTION
				1. The electronic fence alarm system shall operate as a zoned, automatic, supervised, detection and alarm system, integrated with the perimeter security multiplex system (Section 281603) to alert security personnel of an attempted breach of the perimeter security fence. The system operation is summarized as follows:

Sensor cables and signal processors located on the fence detects intruders attempting to climb over or cut through the fence.

The alarm condition from signal processors, gate by-pass units and other alarm sensors are transmitted to the perimeter security console.

The sensor cables and signal processors interpret the various sounds generated by an intrusion attempt and allows the attendant at the perimeter security console to distinguish through the audible feature the various sounds of attempted breaching, tampering or trouble conditions.

Gate by-pass units permit sensor cable protecting gates to be remotely disabled from the perimeter security console while the rest of the cable remains active. The by-pass position of the switch and tampering with the gate by-pass unit is indicated at the perimeter security console.

Zone status and gate by-pass status is continuously displayed by indicating lights on the perimeter security console map display.

All wiring between alarm sensors, signal processors, transponders, gate by-pass units and PSC is completely supervised.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.
				5. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.
				6. Shop Drawings:

Bill of materials.

Wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted).

Detailed description of system operation (format similar to SYSTEM DESCRIPTION).

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Name, address and telephone number of nearest fully equipped service organization.

* + - * 1. Quality Control Submittals:

Installers’ Qualifications Data: Include the following for each person who will be performing the Work:

Name.

Employers name, business address and telephone number.

Name and address of the required number of similar projects worked on which meet the experience criteria.

Company Field Advisor Data: Include:

Name, business address and telephone number of Company Field Advisor secured for the required services.

Certified statement from the Company listing the qualifications of the Company Field Advisor.

Services and each product for which authorization is given by the Company, listed specifically for this project.

* + - * 1. Contract Closeout Submittals:

Test Report: System acceptance test report.

Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.

Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director’s Representative. Include name, address, and phone number of nearest fully equipped service organization.

* + - 1. QUALITY ASSURANCE
				1. 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.

Furnish to the Director the names and addresses of five similar projects which the foregoing people have worked on during the past three years.

* + - * 1. Company Testing Facility: The Company producing the system shall have test facilities available which can demonstrate that the proposed system meets contract requirements.
				2. Equipment Qualifications For Products Other Than Those Specified:

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.

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.

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.

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.

Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.

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.

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.

* + - * 1. Company Field Advisor: Secure the services of Company Field Advisor for a combined minimum of 48 hours for the following:

Edit number of hours to suit.

Render advice regarding installation and final adjustment of the system.

Witness final systems test and certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.

Train facility maintenance personnel in operation and routine maintenance of the system (minimum of 16 hours).

Train facility security personnel in operation of the system (minimum four 2 hour sessions).

Explain available service programs to facility supervisory personnel.

* + - * 1. 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.
			1. MAINTENANCE
				1. Spare Parts:

10 cable splice kits for sensor cable.

One set of tools required for making splices.

500 feet of sensor cable.

One signal processor test unit.

One sensor cable fault locator.

Two complete signal processing units.

Two signal processor circuit cards.

Six fuses.

Package of 100 cable ties.

1. PRODUCTS
	* + 1. ELECTRONIC FENCE ALARM SYSTEM
				1. Signal Processors: GTE Sylvania Inc.’s Model FPS-2.
				2. Sensor Cable: GTE Sylvania Inc.’s FPS-2 Electret Transducer cable with teflon outer sheath in lengths to suit job conditions with connectors and terminations pre-installed.
				3. Gate Bypass Units: Furnish gate bypass units consisting of suitable relays to allow bypassing a designated section of the fence adjacent to gates while keeping the rest of the zone secure. Placing a section in bypass shall be accomplished remotely from the perimeter security console via transponder units.

Bypass equipment shall be housed in a NEMA 4 enclosure with the following:

Gasketed hinged door with lock (lock keyed the same as FAS units).

Tamper switch.

Size as required to house equipment.

Control power between transponder location and gate bypass unit shall be low voltage for transmittal over signal cable type MCG.

Unit shall be equipped to indicate unit status at the perimeter security console.

* + - * 1. Test Units:

Field Test Unit: GTE Sylvania Inc.’s FBS.

Sensor Cable Fault Locator System: GTE Sylvania Inc.’s CFS.

* + - * 1. Interconnection Cable:

Type MPX: Multi-conductor cable with 6 individually shielded twisted pairs of insulated 20 AWG stranded copper wires enclosed in a jacket suitable for direct burial in earth; Belden Corp.’s 9886.

Type MCG: Multi-conductor gate cable consisting of 3 individually shielded twisted pairs of insulated 20 AWG stranded conductors enclosed in jacket suitable for direct burial in earth, Belden Corp.’s 9883.

* + - * 1. Sensor Cable Ties: Weather resistant for outdoor use; Panduit Corp.’s PLT 1.51MO, or Thomas and Betts Corp.’s TY-25MX.
				2. Accessories: System shall include all accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.
			1. TAGS AND NAMEPLATES
				1. Tags: Premarked self-adhesive; W.H. Brady Co.’s B940, Thomas and Betts Co.’s E-Z Code WSL self-laminating, Ideal Industries’ Mylar/Cloth wire markers, or Markwick Corp.’s permanent wire markers.
				2. Nameplates: Phenolic engraved plates; minimum 3/4 inch wide and length as required by inscription as manufactured by Seton Nameplate Corp.
1. EXECUTION
	* + 1. INSTALLATION
				1. Install electronic fence alarm system in accordance with the Company’s printed instructions and interconnect with perimeter security multiplex system (Section 281603) for a complete integrated system.
				2. Install sensor cable on fence as shown on drawings with cable ties spaced at maximum of 12 inches on center.
				3. Make all cable connections, terminations and splices in fence alarm stations.
				4. Tag conductors at terminal strips (designations shall correspond with point to point wiring diagrams).
			2. FIELD QUALITY CONTROL
				1. Sensor Cable Test: Perform a visual inspection of the fence mounted sensor cable to verify proper cable installation free of abrasions and breaks in the outside jacket. Also perform the following continuity/resistance tests with an ohmmeter capable of reading 1 megohm + 25 percent.

Test continuity/resistance between center conductor and shield of sensor cable and record readings. Normal reading shall be 950k to 1.0 megohm.

Test continuity/resistance between shield of sensor cable and fence. Normal reading shall be infinite or maximum resistance of the meter.

* + - * 1. Preliminary System Test:
	1. Preparation: Have the Company Field Advisor adjust the completed system and then operate it long enough to assure that it is operating properly.
	2. Run a preliminary test for the purpose of:

Determining whether the system is in a suitable condition to conduct an acceptance test.

Training Facility Personnel.

Checking and adjusting equipment.

* + - * 1. System Acceptance Test:

Preparation: Notify the Director’s Representative at least three working days prior to the tests so that arrangements can be made to have a Facility Representative witness the tests.

Make the following tests as an integral test required for Section 281603:

Test each system function step by step as summarized under SYSTEM DESCRIPTION.

Perform simulated escape attempts listed below at 10 foot intervals unless otherwise directed (Director’s Representative shall select exact location and type of escape attempt or combination of attempts). Each penetration of the sensor system shall produce an alarm. If it does not, wait 30 seconds and repeat in 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 100 lbs or more. Provide safety equipment and take proper precautions when performing tests. Terminate each test climb at detection or when the climb is complete, whichever comes first.

Fast Climb Over: Approach and make contact with the fence and rapidly scale the fabric until the top is reached. At this point, either jump down or climb down the opposite side of the fence. Typical elapsed time for this intrusion against an 8 foot high, 3 strand barb wire topped chain link fence is 4-8 seconds.

Slow/Stealthy Climb Over: Approach and make contact with the fence and slowly, deliberately, and stealthfully climb to the top of the fence, carefully negotiate the barb wire and climb down the opposite side of the fence. Typical elapsed time for this intrusion against an 8 foot high, 3 strand barb wire topped chain link fence is 10-20 seconds.

Cut Through: At a minimum of one location in each zone, securely attach or tightly weave a 2 x 2 foot square sample of fence fabric to the lower portion of the fence. Sample fabric shall be identical to existing fence fabric. Cut sample fabric and note number of cuts and time to alarm (Do not damage fence). Typical elapsed time is 20 seconds. Remove sample fabric.

Perform the following tests to show that the system will not alarm from the following stimuli:

A person weighting 100 to 200 lbs. walking at 3 mph within 10 feet of the protected fence.

Omit subparagraph below if horse mounted patrols are not used.

A person on horseback riding at 3 mph within 15 feet of protected fence.

Supply all equipment necessary for system adjustment and testing.

Submit written report of test results signed by Company Field Advisor and the Director’s Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the control panel.

* + - * 1. System Testing and Adjusting During Guarantee Period:

After satisfactory completion of acceptance test, Facility personnel will investigate and record all system alarms. If the system does not meet the following criteria it shall be considered defective under the terms of paragraph 9.8 of the General Conditions:

False alarms that are internally generated within the system shall not exceed 1 per 100 hrs.

False alarms caused by the following weather conditions shall not exceed 1 per zone per 48 hours:

Wind up to 30 mph.

Rain up to 3 inches per hour.

Snow up to 5 inches per hour.

Within one week of notification that any zone does not meet the above criteria, make arrangements for the Company Field Advisor to correct the zone and retest in accordance with 3.02 C.2. b. & c.

END OF SECTION 281605