SECTION 281615 - MODIFICATIONS TO ELECTRONIC FENCE ALARM SYSTEM

1. GENERAL
   * + 1. RELATED WORK SPECIFIED ELSEWHERE
          1. Modifications To Main Security Console: Section 281611.
          2. Fence Accessory Stations For Perimeter Security Systems: Section 281602.
          3. Microwave Detection System: Section 281604.
          4. Infrared Detection System: Section 281607.
          5. Modifications To Perimeter Surveillance CCTV System: Section 282315.
       2. DESCRIPTION OF EXISTING SYSTEM

Do not use the description of existing system solely as written. It is only a guide. Modify to suit existing system. Refer to the original project manual and shop drawings for an accurate description of existing system.

* + - * 1. The existing perimeter alarm system operates as an automatic detection and alarm system to alert facility personnel of any change in status of all monitored perimeter alarm system zones.
        2. The existing perimeter is divided into sensor cable (with signal processors) zones, and one infrared detection system zone.
        3. The main components of the perimeter alarm system consist of the following equipment which are products of Perimeter Products Inc. (PPI), of Mountain View, CA:

PPI’s MX-1040, zone monitor (multiplex control center).

PPI’s CEnDe, data collection unit.

PPI’s FPS-2, sensor cables and signal processors.

PPI’s RMI-1040, map interface.

PPI’s ARI, relay interface.

* + - * 1. The zone monitor performs the following:

Provides power for each signal processor and transponder located at the perimeter fence.

Indicates alarm, tamper, access or secure conditions for every zone in the system thru the use of various colored lamps on the zone monitor and the map display.

Sounds an audible alarm for all alarm, tamper, and trouble conditions within the system.

Provides audio monitoring for every sensor cable zone in the system, allowing facility personnel to distinguish various sounds of attempted breaching, tampering, or trouble conditions.

Thru the relay interface, automatically initiates switching of the perimeter surveillance CCTV systems’ camera station, covering any zone in alarm, to a designated monitor in the main security console.

Thru the map interface operates the map display.

Prints out change in the system’s status, indicating the date, time, system, and/or zone condition, zone number, and operator number.

The keypad on the zone monitor allows facility personnel to:

Acknowledge changes in the system’s status (alarm, tamper and trouble conditions).

Place any zone in the access mode.

Program system functions.

Perform a self-test of the complete system or individual zones.

* + - * 1. Upon loss of A.C. operating power the complete system is automatically switch to a battery back-up system, which maintains operations of the complete system for a minimum of 4 hours.
        2. Tamper alarms for fence accessory stations (FAS) are indicated by individual lamps in a schedule on the map display.
        3. Gate by-pass units (relays) at the perimeter fence are controlled from the main security console.

Gates in the by-pass mode are indicated by lights on the map display.

* + - * 1. All wiring between signal processors, transponders, infrared detection units, and the zone monitor is completely supervised.
      1. MODIFICATIONS TO THE EXISTING SYSTEM

List and explain modifications to existing system. Example:

* + - * 1. Add alarm zones.
        2. Reprogram system to accommodate added alarm zones.
      1. DESCRIPTION OF COMPLETED SYSTEM

Describe completed system operation. Example:

* + - * 1. The completed system shall operate as outlined in DESCRIPTION OF EXISTING SYSTEM.
      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:

Composite wiring and/or schematic diagrams of the modifications as proposed to be installed (standard diagrams will not be accepted).

Interconnection details between the systems monitored and controlled by the perimeter alarm system.

Scale drawing of map display showing site drawing and exact locations of lamps.

Scale drawings of dual zone processor enclosures showing location and mounting of components.

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Bill of materials.

Detailed description of completed system operation.

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

* + - * 1. Quality Control Submittals:

Copy of license for installing Security Systems.

Also include copy of identification card issued by the Licensee for each person who will be performing the work.

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 addresses 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.

Test Report: Existing system test report.

* + - * 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:

Operation and maintenance data for each product.

Complete point to point wiring diagrams of entire system as installed. Number all conductors and show all terminations and splices. (Numbers shall correspond to numbered tags installed on each conductor.)

Name, address, and telephone 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 3 years.

Furnish to the Director the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.

Adjust number of hours to suit.

* + - * 1. Company Field Advisor: Secure the services of a Company Field Advisor from Perimeter Products Inc. for a minimum of 60 hours for the following:

Render advice and witness test of existing system.

Render advice regarding modifications to the system.

Engineering associated with interconnecting between the related systems.

Assist in reprogramming the system.

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

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

Twelve replacement lamps for each color lamp in the map display.

Six of each size fuse.

Two 1000 foot rolls of sensor cable.

2000 sensor cable ties.

Eight sensor cable termination/splice kits.

One dual zone processor.

One transponder.

One signal processor board for dual zone processor.

One transponder board for dual zone processor.

Five relays for relay interface.

1. PRODUCTS
   * + 1. ZONE MONITOR

Specify required products. Verify that products specified are compatible with existing system.

* + - * 1. Perimeter Products Inc.’s COMGARD MX-1000 Series multiplex control center, having:

60 zone configuration (minimum).

Internal printer.

Provisions for rack mounting in 19 inch wide rack.

Internal power supply with battery back-up, and ampere-hour capacity to operate the following for a minimum of 4 hours:

Zone monitor.

All existing signal processors and transponders.

All dual zone processors and transponders provided under this contract.

All components necessary to perform the functions summarized under DESCRIPTION OF COMPLETED SYSTEM.

* + - 1. RELAYS FOR RELAY INTERFACE
         1. Perimeter Products Inc.’s RELAY.
      2. MAP INTERFACE
         1. Perimeter Products Inc.’s COMGARD RMI-1000 series map interface, having:

60 zone configuration (minimum).

* + - 1. MAP DISPLAY
         1. Ontario Control System’s PRB series graphic annunciator, having:

Overall size of 30 inches high by 48 inches wide by 3 inches deep for mounting on top of main security console at a 30 degree tilt.

Custom enclosure as shown on drawings for mounting on top of main security console (enclosure finish shall match finish of console sides and back).

Map constructed of smoked dark grey acrylic with graphics silk screened in white. Graphics shall be a scale drawing of site, showing:

All existing security fences.

All security fences installed under this project.

All existing perimeter alarm zones and their designations.

All perimeter alarm zones installed under this project and their designations.

All existing camera stations and their designations.

All camera stations installed under this project and their designations.

All existing fence accessory stations (FAS) and their designations.

All fence accessory stations (FAS) installed under this project and their designations.

All existing signal processors and their designations.

All dual zone processors installed under this project and their designations.

All existing gate by-pass units.

All existing building outlines and their number.

All buildings constructed under this project and their numbers.

Indicating lamps for each system for each zone as follows:

Red LED at the center of each zone which flashes to indicate zone “alarm” (upon depressing acknowledge switch, LED stops flashing but remains illuminated).

Yellow LED at center of each zone to indicate zone “access”.

Green LED at center of each zone to indicate zone “secure”.

Tamper alarms indicated on a schedule on the map display as follows:

One red LED and description for each “tamper” zone listed in the schedule on the drawings.

17 additional spaces, complete with LED’s, for future alarm indications (description space blank) as listed in the schedule on the drawing.

Indicating LED’s for each gate by-pass unit as follows:

Red LED adjacent to each gate by-pass unit on the map to indicate “access”.

Green LED adjacent to each gate by-pass unit on the map to indicate “secure”.

Power supply with batteries:

Upgrade existing power supply and batteries to operate map display for a minimum of 4 hours upon loss of AC power.

Power supply sized to operate all LED’s of the map display, including LED’s for future alarm spaces listed above, and to recharge batteries.

Provide additional sealed, lead-acid gelled batteries as required to operate map display for a minimum of 4 hours upon loss of AC power.

Mount power supply and batteries in existing main security console.

* + - * 1. Console rack: Mount equipment in existing main security console.
      1. TRANSPONDERS
         1. Perimeter Products Inc.’s STAND-ALONE TRANSPONDER.
      2. DUAL ZONE PROCESSORS
         1. Perimeter Product Inc.’s FPS-2-2M, dual zone signal processor with multiplex output.
      3. ENCLOSURES FOR DUAL ZONE PROCESSORS (ZP)
         1. Hoffman’s Bulletin A-4 NEMA Type 4X stainless steel enclosure, having:

Dimensions as required for installation of components (minimum dimensions shown on drawings).

Single gasketed door with continuous hinge and lock.

All ZP enclosure locks to be keyed the same. Furnish 2 keys.

Twelve gage steel mounting plate within enclosure for mounting components and future components.

Tamper switch to indicate opening of enclosure door.

Stainless steel external hardware.

Louvers as required for ventilation and to prevent temperature rising above equipment ratings.

Barrier type terminal strips.

Mounting accessories as required.

* + - 1. SENSOR CABLE
         1. Perimeter Products Inc.’s MEX series transducer sensor cable, with:

Ultraviolet resistant cable ties.

* + - 1. TERMINATION/SPLICE KITS
         1. Perimeter Products Inc.’s TSK transducer service kit.
      2. INTERCONNECTION CABLE
         1. Multiplex Cable, Type MPX: Multi-conductor cable with 3 individually shielded twisted pairs of insulated 18 AWG stranded copper wires enclosed in a jacket suitable for direct burial, and as recommended by the Company producing the system.
         2. Tamper Cable, Type TMP: Multi-conductor cable with 1 individually shielded twisted pair of insulated 18 AWG stranded copper wires enclosed in a jacket suitable for direct burial, Belden 8760.
         3. Non-sensitive coaxial cable, as recommended by the Company producing the system.
      3. SURGE SUPPRESSORS
         1. Equip system with surge suppressors to protect equipment from voltage transients and lightning surges.
      4. MARKERS AND NAMEPLATES
         1. Markers: 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: Precision engraved letters and numbers with uniform margins, character size minimum 3/16 inches high.

Phenolic: Two color laminated engraver’s stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).

Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

* + - 1. ACCESSORIES
         1. Include accessories as required for the modifications to perform the functions summarized in DESCRIPTION OF COMPLETED SYSTEM and indicated on the drawings.

1. EXECUTION
   * + 1. PREPARATION
          1. Test of Existing System:

Prior to modifying the system, test portions of the existing system affected by the modifications to ascertain their operating condition.

* + - * 1. Modify zone numbers to suit project.

Conduct fast or slow climb-over tests (method as described under SYSTEM ACCEPTANCE TEST) at various locations as directed in zones 8, 9, 10, 11 and 12.

Test security console functions.

Prepare a written report for the Director’s Representative indicating the repairs required, if any, to make the existing system function properly.

Repairs to the existing system are not included in the Work unless requested by Order on Contract.

* + - 1. INTERRUPTIONS TO EXISTING SYSTEM
         1. Maintain the existing system in its present condition to the extent possible while performing the required modifications.
         2. Prior to making changes or removals relative to the existing system, notify the Director’s Representative and have procedures approved.
         3. Plan and perform modifications so that entire system is activated at all times. Make temporary connections as required.

Modify procedure to suit. Modify zone numbers to suit project.

Interruptions to existing zones Nos. 9, 10 and 11 will be allowed during daylight hours, when approved by the Director’s Representative in advance.

* + - 1. INSTALLATION

Edit paragraph below for integrated systems.

* + - * 1. Install the Work in accordance with the Company’s printed instructions. Interconnect with infrared detection system (Section 281607) and the perimeter surveillance CCTV system (Section 282301) for a completely integrated system.
        2. Make cable connections, terminations, and splices in fence accessory stations (FAS), dual zone processor enclosures, infrared detection system junction boxes, and console. Splices will not be permitted at any other locations.

Use markers to identify conductors at terminal strips, cabinets, and pull boxes (designations shall correspond with point to point wiring diagrams).

* + - * 1. Install surge protection on each conductor entering and leaving console.
      1. 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 conductors and shield of sensor cable and record readings. Normal reading shall be as recommended by the manufacturer of the sensor cable.

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:

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

Run a preliminary test for the purpose of:

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

Checking and adjusting equipment.

Training facility personnel.

* + - * 1. System Acceptance Test:

Preparation: Notify the Director’s Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.

Make the following tests:

Individually test alarm initiating points.

Individually test control points.

Test audible and visual alarm devices.

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

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 to 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:

1. A person weighting 100 to 200 lbs. walking at 3 mph within 10 feet of the 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 3.04 C.2.

END OF SECTION 281615