SECTION 281604 - MICROWAVE DETECTION SYSTEM

Use this section in conjunction with section 281603.

1. GENERAL
   * + 1. RELATED WORK SPECIFIED ELSEWHERE
          1. Video Training Programs: Section 017900.
          2. Main Security Console: Section 281601.
          3. Fence Accessory Stations For Perimeter Security Systems: Section 281602.
          4. Perimeter Security Multiplex System: Section 281603.
       2. SYSTEM DESCRIPTION
          1. The microwave detection system shall operate as a zoned, outdoor perimeter protection system integrated with the perimeter security multiplex system (Section 281603) which detects movement and causes an alarm to be sounded at the main security console when an intrusion occurs in the space between the 8 foot high taut wire fence and the 16 foot high chain link fabric fence.

Change “taut wire” to “chain link fabric” if applicable.

Each microwave transmitter and receiver combination (zone) can be remotely tested from the console by activating a “zone test” function via the perimeter security multiplex system.

Tampering with the microwave transmitter units, receiver units, and associated control boxes causes a “tamper alarm” condition at the main security console (this condition is independent of a “perimeter zone alarm” condition.)

* + - 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 complete system as proposed to be installed (standard diagrams will not be accepted).

Scale drawings showing exact location of microwave receivers and transmitters (drawing shall be from Company producing microwave transmitter and receiver).

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Bill of materials.

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

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.

* + - * 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.

* + - * 1. Source Quality Control: 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 Advisors: Secure the services of a Company Field Advisor for a minimum of 80 hours for the following:

Edit number of hours to suit.

Render advice regarding installation and final adjustment of 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.

Train facility personnel on the operation and maintenance of the system (minimum of 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:

One microwave transmitter unit and control box.

One microwave receiver unit and control box.

One microwave transmitter test unit.

Six of each size fuse.

Metal sphere used for final test.

1. PRODUCTS
   * + 1. MICROWAVE DETECTION SYSTEM
          1. Microwave Transmitter and Receiver Units: Shorrock Inc.’s Model 33, or Southwest Microwave Inc.’s Model 300-B, having:

Control box if required.

Remote test function (activated by the closing of momentary contacts in transponder).

Input circuit suitable for operation on 12 or 24 volts DC.

* + - * 1. Mounting Post: Galvanized steel pipe (Schedule 40), size as indicated on drawings.
        2. Microwave Transmitter Test Unit: As produced by Schorrock Inc. for operation with Model 33 Transmitter; or Southwest Microwave Inc. for use with Model 300-B.
        3. Interconnection Cable:

Type MCC-M: Multi-conductor cable with 6 individually shielded

* + - * 1. twisted pair of insulated 20 AWG stranded copper wires enclosed in a jacket suitable for direct burial in earth; Belden Corp.’s 9886, Carol Cable Co. Inc.’s C6062, Quabbin Wire & Cable Co. Inc.’s 6175, Remee Product Corp.’s 3039DB, or Tappan Wire & Cable Inc.’s 2050AT6DB.
        2. Surge Suppressors: As required to protect equipment from transients and lightning.
        3. Central 12 or 24 volt nominal DC power supply as required and batteries for powering microwave transmitters and receivers:

Power supply capacity suitable for powering all receivers and transmitters and recharging the batteries.

Batteries sized to operate all transmitters and receivers for 4 hours upon loss of AC power.

Sealed, lead-acid, gelled electrolyte batteries.

Mount power supply and batteries in main security console.

* + - 1. CONCRETE BASES
         1. As detailed on the drawings. Bases may be precast or poured in place.
      2. 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, Markwick Corp.’s permanent wire markers, or Plastic Extruded Parts Inc.’s Flexible Sleeve or ID Band 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. System shall include all accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.

1. EXECUTION
   * + 1. INSTALLATION
          1. Install microwave detection system in accordance with Company’s printed instructions and interconnect with perimeter security multiplex system (Section 281603) for a complete integrated system.
          2. Exact location of microwave receiver and transmitter units shall be as recommended by the Company producing the system.

Install units to facilitate snow removal from detection zone.

Do not install units less than 10 feet from inner 8 foot high fence or less than 8 feet from outer 16 foot high fence.

Have Company Field Advisor mark exact location of transmitter and receiver units at the site.

* + - * 1. Install a ground rod at each receiver and transmitter location for connection of surge protection equipment.
        2. Make cable connections, terminations, and splices in fence accessory stations, and control boxes of microwave transmitters and receivers. Splices will not be permitted at any other locations.

Terminate spare conductors at terminal strips.

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

Install surge protection on each conductor entering and leaving transmitter and receiver unit or control boxes.

* + - * 1. Install nameplates on each transmitter and receiver control box with designation as indicated on drawings.
      1. FIELD QUALITY CONTROL
         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 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 as an integral test required for Section 281603:

At 10 foot intervals within each zone, pull a metal sphere, approximately 30 cm in diameter, perpendicular across each zone at 1.5 cm per second. Each test shall produce an alarm. If it does not, conduct a “belly crawl” test (as described in paragraph b. below) at the same location. If the “belly crawl” test does not produce an alarm the entire zone must be corrected and retested. If “belly crawl” test is detected, adjustment for that location will be considered acceptable. (Test adjacent to transmitter and receiver location may be detected by the adjacent zone.).

Perform simulated escape attempts listed below at 50 foot 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.

Walk Test: Walk slowly across detection zone perpendicular to the beam.

Run Test: Run quickly across detection zone perpendicular to the beam.

Crawl Test: Crawl as low as possible on hands and knees across detection zone perpendicular to the beam. This test shall be conducted immediately adjacent to each transmitter and receiver as well as other locations where directed (tests at transmitter and receiver locations may be detected by adjacent zone).

Belly Crawl: Crawl on stomach across detection zone parallel to beam (2 inches per second). This test shall be conducted immediately adjacent to each transmitter and receiver as well as other locations where directed. (Tests at transmitter and receiver locations may be detected by adjacent zone).receiver as well as other locations where directed. (Tests at transmitter and receiver locations may be detected by adjacent zone.)

Test each function summarized in SYSTEM DESCRIPTION.

Map out extent of microwave signal within each zone.

Supply all equipment necessary for system adjustment and testing.

Submit written report of test results signed by Company Field Advisor and Director’s Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly adjacent to the console. Include the following on the test form:

Sensitivity setting of each receiver (sensitivity setting should be 70 percent of maximum or less and in no case shall be greater than 80 percent of maximum).

Height of each receiver and transmitter.

Length of each zone.

Weather conditions during test.

* + - * 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 l 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 B. 2. a. & b.

END OF SECTION 281604