SECTION 281604 - MICROWAVE DETECTION SYSTEM - TESTING AND ADJUSTMENTS

Prior to using this section, check with Ajai Shankar or Tony Beza of BU#1 Electrical Design.

This section is to be used in conjunction with Section 015634 Maintaining Perimeter Security.

This section is to be used when the work requires excavation between the perimeter security fences of Correctional Facilities with microwave detection system zones and the work does not require modifying the security systems themselves.

See the end of this section for general notes that should be placed on the site drawings for each contract working near the perimeter fences.

Additional specification sections and drawings will be required if modifications to the existing security systems are required to allow for the installation of the work of this contract.

1. GENERAL
   * + 1. DESCRIPTION OF EXISTING SYSTEM
          1. The microwave detection system operates as a zoned, outdoor perimeter protection system integrated with the perimeter security multiplex system 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 chain link fabric fence and the 16 foot high chain link fabric fence.

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.)

The existing system manufacturer:

List manufacturer of existing microwave units at contract site (a and/or b below).

Southwest Microwave, Inc.

Shorrock, Inc.

* + - 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. Quality Control Submittals:

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.

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.

* + - * 1. Contract Closeout Submittals:

Test Report: Test Report of microwave system after completion of work between the perimeter fences.

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

* + - 1. QUALITY ASSURANCE
         1. Company Field Advisor's Qualifications:

Company Field Advisor: An employee of an organization certified by the manufacturer of the existing microwave detection system to be technically qualified in design, installation and servicing of the required products.

The persons installing the Work of this Section and their supervisor shall be personally experienced in the installation and design of outdoor microwave detection 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.

The Company Field Advisor or the company that employs the Company Field Advisor shall be licensed to install security systems in New York State.

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

Perform preliminary system tests.

Render advice regarding repairs and final adjustment of the system.

Make adjustments to the system (I. E. re-align or aim the microwave units).

Perform Final system tests and certifies with an affidavit that the system is operating properly.

* + - * 1. Service Organization Information: Provide information in accordance with the requirements of section 015634.

1. PRODUCTS
   * + 1. ACCESSORIES
          1. Provide all materials required for testing and adjusting the microwave system equipment.
2. EXECUTION
   * + 1. DESCRIPTION OF WORK
          1. In microwave zones where the work required by this contract is being performed, perform the following:

Prior to performing any work between or near the perimeter fences, the microwave zones are to be tested to confirm that they are operating properly and to determine if there are any repairs required to the system.

* + - * 1. After the completion of the work in each zone, the microwave zone is to be tested to confirm that it is operating properly. If the zone is not operating properly, adjustments are to be made to that zone's microwave equipment and/or to the grading of the zone, then the zone is to be re-tested to confirm that it is operating properly.
      1. INTERRUPTIONS TO EXISTING SYSTEM
         1. Prior to performing work relative to the existing microwave detection system, notify the Director's Representative and have procedures approved.
         2. Plan and perform the work on and between the fences so that the entire perimeter microwave detection system (all zones) are activated at all times. Submit the plan for performing the work on and between the perimeter fences to the Director's representative for approval.

Interruptions to up to 2 zones maybe permitted if approved in advance with the Director's Representative, and the Director Representative sees no alternatives to the interruptions.

ALL microwave zones will be fully operational every night during the construction period.

* + - * 1. Maintain the existing system in its present condition to the extent possible while performing the required work between the perimeter fences.
        2. The contractor shall be held liable for any damages to the microwave detection system equipment, while performing the work between the fences.
      1. FIELD QUALITY CONTROL
         1. Microwave System Test Procedures:

Each day prior to performing any work in a microwave zone, have facility personnel test the zone in accordance with the Department of Correctional Services weekly testing procedures, to ascertain the zone's operating condition.

Department of Correctional Services requires that each microwave zone be tested weekly as follows:

Test the microwave zone by walking in a zigzag pattern through the entire zone. Detection should occur approximately 3 to 5 seconds after entering the zone. Detection should cause the perimeter multiplex system to go into alarm and switch the appropriate CCTV camera to the alarm monitor and cause the system VCR to record the camera viewing the zone in alarm.

Check to see that, upon alarm pan/tilt/zoom cameras automatically move to view the zone in alarm.

Prior to performing a test on a perimeter zone monitored by pan/tilt/zoom camera station, so to confirm proper functioning of the camera station, perform the following:

1. Pan the camera station 90 degrees away from the zone that is to be tested.
2. Tilt the camera station to an angle other than what will be called up when the zone goes into alarm.
3. Adjust the lens' field of view to a setting other than what will be called up when the zone goes into alarm.

Check to see Fixed cameras are still aimed to view the zone.

Where the microwave zone intersects with adjacent zone (another microwave zones or a zone of another type of detection system) check to make sure that detection occurs in: either the zone you are testing, the adjacent zone, or both zones.

Check the entire zone for environmental conditions that could effect the operation of the zone. Specifically check for:

Debris.

Weeds.

Snow (greater than 6 inches in depth).

Erosion.

Record test of the zone on the appropriate Department of Correctional Services' forms, noting failures or any conditions that could effect operation of the zone.

At the end of each day after performing any work in a microwave zone, have facility personnel test the zone in accordance with the Department of Correctional Services weekly testing procedures, to ascertain the zone's operating condition.

Submit written report of test results signed by Facility Personnel who performed test and Director's Representative.

* + - * 1. System Acceptance Tests (upon completion of all work between perimeter fences):

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.

Have the Company Field Advisor 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.

Check alignment between transmitter and receiver.

Check that the sensitivity setting for each zone is set within 40 to 50 percent of maximum.

Check that tamper switches within microwave transmitter and receiver unit operate and are monitored an annunciated at the main security console.

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.

Have the Company Field Advisor test each microwave zone in accordance with the Department of Correctional Services Annual testing procedures, to ascertain the zone's operating condition.

Department of Correctional Services requires that each microwave zone be tested annually as follows:

Perform the weekly Test.

Attach the microwave test unit to the microwave receiver unit.

Remove covers from both the microwave transmitter and receiver unit.

Verify that tamper alarms are reported at the main security console upon removal of covers.

Check that the channel selected at both units is the same.

Check the sensitivity setting at the receiver is set between 40 to 50 percent of maximum.

Verify alignment of the transmitter and receiver unit with the microwave test unit.

Adjust alignment of the transmitter and receiver units for optimum alignment if signal strength is not sufficient.

Walk test the middle of the zone to determine the zone width.

From inside the facility, at the middle of the zone, stand approximately 12 to 15 feet (perpendicular) from the centerline of the beam (or with your back to the inner fence), slowly walk toward the beam using 6 inch steps until the microwave test unit alarms. Stop walking this is the edge of the beam on that side of the zone.

Cross the zone and again start outside the zone approximately 12 to 15 feet perpendicular from the centerline of the beam (or a few inches away from the security coils on the outside fence), slowly walk toward the beam using 6 inch steps until the microwave test unit alarms. Stop walking this is the edge of the beam on that side of the zone.

The distance between the 2 alarmed points is the maximum width of the zone, which is greatest at the middle of the zone.

Ensure that the zone does not detect the edge of the security (razor) coils. Adjust the sensitivity (to increase/decrease) the maximum width so it detects approximately 1 to 2 feet from the security coil.

Crawl test with a slow belly crawl the overlap (or ends) of the zone under test with the adjacent zones.

This test should be done favoring the side of the midpoint of the overlap of the zone under test with the adjacent zone (which is approximately 15 to 25 feet from the microwave unit at that end of the zone).

1. Where the microwave zone shoots through a fence, the crawl test should be made at the base of both sides of the fence. Detection should occur on both sides of the fence.
2. If the microwave zone shoots through more than one fence, then the crawl test should be made at both sides of each fence.

Verify with the attendant at the main security console that the alarm was received.

1. During the crawl test, monitor the microwave test unit to verify for proper sensitivity setting of the zone.
2. Adjust sensitivity setting of the zone, if signal strength is not sufficient. Adjustment to the height of the microwave heads may be required to detect a crawling target.

Repeat this test the test at the other end of the zone.

A Human shaped test dummy of approximately 5 to 6 feet in height may be used in lieu of an actual person performing the belly crawl test. Drag the dummy across the zone by rope.

1. Do not use an aluminum ball for the crawl test. The sensitivity setting to pick up the ball would make the sensitivity for the zone to high, and cause excessive nuisance alarms in the zone.

Use extra care to ensure sufficient detection in corner zones. Microwave unit at corner zones may be required to be located closer to the ground to ensure sufficient overlap with adjacent zones.

Record test of the zone on the appropriate Department of Correctional Services' forms.

END OF SECTION 281604

Designer information:

The following general notes should be place on the site drawings.

General security notes: (all drawings)

A. All work near the perimeter security fences must be performed in such a manner so as to maintain perimeter security at all times in strict accordance with section 015634 of the project manual.

B. The facility is protected by perimeter fences, perimeter fence lighting system, perimeter alarm systems and perimeter surveillance CCTV system, which are integrated together to work as a single perimeter security system. These systems shall be fully operational at all times during the work of this contract. The work required by this contract near these systems, shall be performed in such a manner so as to prevent any down time (interruptions) to any of these systems.

C. The exact locations of existing underground utilities and perimeter security system lines are unknown and shown approximate only. Before any work is started near the perimeter fences, determine exact location of all underground utilities and perimeter security system lines (whether shown on drawings or not) by use of Metrotech or similar tracing equipment. Mark and protect all underground utilities and perimeter security system lines. Contractor shall be held responsible for any damage to any underground utilities and perimeter security system lines.

D. Extreme caution shall be used when working near the perimeter security systems and their associated conduits. The contractor shall be held responsible for any damage to these systems and/or losses due to damage to these systems, including the cost to repair the damage and any cost incurred by the state for additional security staff to protect the perimeter of the facility due to any outages of the security systems.

1) hand excavation should be used when working near the perimeter security system conduits and/or ductbank.

2) where tunneling below the ductbank, provide support to the ductbank to prevent collapse.

E. The grading of the ground surface of the microwave zones where the work between the perimeter fences was performed must be restored back to its original condition. Neither a rise nor depression in the ground surface created by back filling the trench will be acceptable. The back fill soil must be compacted sufficiently to prevent settling and the cover stone must be restored original condition.

END OF INFORMATION 281604