SECTION 282301 - PERIMETER SURVEILLANCE CCTV SYSTEM

Use this section in conjunction with section 281603. This section is written specifically for outdoor perimeter surveillance.

1. GENERAL
   * + 1. RELATED WORK SPECIFIED ELSEWHERE
          1. Video Training Program: Section 017900.
          2. Optical Fiber Cables: Section 271524.
          3. Main Security Console: Section 281601.
          4. Fence Accessory Stations For Perimeter Security Systems: Section 281602.
          5. Perimeter Security Multiplex System: Section 281603.
          6. Systems Programming Computer: Section 281650.
       2. SYSTEM DESCRIPTION
          1. The perimeter surveillance CCTV system consists of camera stations located adjacent to the perimeter security fence and at other strategic locations, and are operated in conjunction with monitors and a microprocessor based central processing unit (TVCPU) located in the main security console.
          2. The system, when expanded to its full capacity has a minimum of 64 video input sources (cameras, VCR'S, etc.) and 8 video outputs (monitors and VCR'S which are connected to the output of the TVCPU).
          3. An attendant at the main security console operates the system and observes the monitors to survey and evaluate the status of personnel in the areas within range of the camera stations.
          4. Scenes are viewed by camera stations:

Zoom-pan/tilt camera stations contain equipment required for completely adjustable viewing of scenes (remotely controlled from TVCPU keyboard control unit).

Fixed camera stations contain equipment required for viewing a fixed scene (not remotely adjustable).

* + - * 1. The video signal from each camera station is transmitted to a dedicated monitor for that camera station.

The video signal is transmitted to the dedicated monitor from the camera via an optical fiber bi-directional transmission system.

Optical fiber bi-directional transmitters (OFBDT's), located in the FAS enclosures:

Transmit the camera station's video signal to its receiver.

Receive camera control signals for the camera station's receiver/driver control unit.

Optical fiber bi-directional receivers (OFBDR's), located in the main security console:

Receive the camera station's video signal.

Transmit camera control signals to the camera station's receiver/driver control unit.

Each dedicated monitor continuously displays the scene viewed by the camera station to which it is dedicated.

Dedicated monitors are not controlled by the TVCPU.

The scenes displayed by dedicated monitors are also displayed on selected monitors which are connected to the output of the TVCPU.

* + - * 1. Camera stations also transmit video signals to the TVCPU via a "looped-through" connection in the dedicated monitors (camera to dedicated monitor input, dedicated monitor output to TVCPU input) for crosspoint switching, control, and distribution to monitors and VCR'S, which are connected to the output of the TVCPU. Any video input source of the TVCPU may be switched to any video output source of the TVCPU at any time.
        2. A keyboard control unit, connected to the TVCPU, allows the attendant to control the following:

Camera station functions including addressing, pan and tilt (joystick control) zoom, and focus. (Iris is automatically controlled, not manually controlled through TVCPU).

Alarm closure arm and clear.

Camera station automatic sequencing run and hold.

The programmed sequence may either be continuously repeated until the hold button is depressed or the sequence may be programmed to stop on a selected camera station until the run button is pushed.

Single "quick look" sequence.

Call up of pre-positioned scenes.

Call up of any camera station to any monitor connected to the output of the TVCPU.

* + - * 1. Up to 3 auxiliary functions (can be latching or momentary control points). Can be indicated in subparagraph below.

Auxiliary Functions:

* + - * 1. The TVCPU can be programmed by the system manager via the keyboard control unit or thru the use of a software package run by the systems programming computer (Section 281650) connected to the TVCPU. The following features can be programmed by the system manager:

Automatic roll-free sequencing of camera stations in any order on monitors connected to the output of the TVCPU.

Dwell time (2 to 60 seconds) that each camera station scene is displayed in sequence on the monitor.

Time and date.

On screen camera station identification (2 or 3 digit numeric plus up to 16 alphanumerics for each individual camera). The identification positioning and brightness is independently adjustable for each monitor.

Sixteen pre-positioned scenes for each zoom-pan/tilt camera station.

* + - * 1. Access to the system functions are controlled thru at least 2 levels of access security to prevent program modifications or use by unauthorized personnel.

At the lowest level of access the keyboard programming functions are disabled. The attendant has minimum access to the system functions (camera switching and remote control).

At the highest level of access, programs may be modified by the system manager.

* + - * 1. Up to 64 independent 2 wire closures are available for external alarms. Specify how system is to operate for each type external alarm. Several variations of automatic call-up software programs are available. (paragraph below is an example of automatic call-up upon alarm from the perimeter security multiplex system).
        2. Upon an alarm from the Perimeter Security Multiplex System (Section 281603):

The video from the camera station for the zone in alarm is automatically called up and displayed on a specific monitor connected to the output of the TVCPU.

The camera automatically pans, tilts, zooms, and focuses to the programmed pre-position scene for the zone in alarm.

Alarm overrides camera sequence on the alarm (armed) monitor.

Multiple alarms cause sequencing at the rate of 2 seconds among alarmed camera stations.

Attendant may enable or disable alarm call up, and may arm or disarm individual camera stations for alarm call up.

Alarm status (arm/off) of each camera and monitor is displayed on the monitors.

The video signal from the camera station in alarm is automatically connected to a VCR in the main security console.

The VCR is automatically activated.

If VCR is "stopped" it will automatically "start" and record video in "real-time" mode.

If VCR is currently operating in the "time-lapse" mode, it will automatically switch to the "real-time" mode.

Time, date, and camera station identification is recorded on tape in conjunction with the video from the camera station in alarm.

An indicating lamp over the monitor for the cued camera illuminates.

* + - * 1. When camera station signals are displayed on monitors connected to the output of the TVCPU, camera station identification, date, and time are also displayed.
        2. Use of subparagraph below. Has been directed by the department of correctional services (memo dated 8/15/88). Show remote video and control jacks on the drawings in the Superintendents' Office, Deputy Superintendent of Security's Office, and the training room.
        3. Remote video and control jacks connected to the TVCPU allow video monitor and keyboard control unit in mobile video cabinet to be connected at remote location to view scenes from all of the cameras connected to the TVCPU.

Keyboard control unit in the mobile cabinet allows operator to select cameras viewed on the remote monitor including sequencing, run and hold. Operator at remote location can not affect display on any monitor in the control room.

* + - * 1. Failure of the 120V ac primary (main) power supply:

Causes the system to be non-functional.

Title memory (camera station identification) is non-volatile and does not have to be reprogrammed upon failure of primary and secondary power supplies.

Automatically transfers TVCPU to its secondary (standby) power supply to maintain:

Time/date generator for a minimum of 2 hours.

Pre-position scene programming memory for minimum of 8 hours.

* + - 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:
         7. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be accepted), including video signal integrity equipment, etc. required for a complete system.

Scale drawings showing mounting of camera station components.

Details of camera station poles and bases.

Scale drawings showing location and mounting of components to be mounted in the main security console.

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Bill of materials.

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

State number of video inputs and outputs used specifically for this project and number of video inputs and outputs available for future use if system is expanded to maximum capacity.

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.

Design Data: Certified data from the manufacturer of the camera station poles proving that the deflection rate will not exceed the specified limits.

Installer's Qualifications Data: Include the following for each person who will be performing the Work:

Name.

Employer's 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:

Video tape test recordings (scenes).

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. Identify all conductors and show all terminations and splices (identification shall correspond to markers installed on each conductor).

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

* + - 1. QUALITY ASSURANCE
         1. 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. Installer's Qualifications: The persons installing the Work of this Section and their supervisor shall be personally experienced in closed circuit television systems and shall have been engaged in the installation of closed circuit television 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. Test Facility: The Company producing the system shall have test facilities available which can demonstrate that the proposed system meets contract requirements.
        2. Company Field Advisor (TVCPU): Secure the services of a Company Field Advisor from the Company producing the TVCPU for a minimum of 64 hours for the following:

Edit number of hours to suit.

Render advice regarding installation and final adjustment of the system.

Engineering associated with interconnections between the perimeter surveillance CCTV system (Section 282301) and the perimeter security multiplex system (Section 281603).

Engineering associated with interconnections between the TVCPU and the cameras.

Assist in initial programming 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 maintenance personnel in operation, programming and routine maintenance of the system (minimum of 16 hours).

Edit number of hours to suit.

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

Edit number of sessions and hours to suit.

Explain available service programs to facility supervisory personnel for their consideration.

* + - * 1. Company Field Advisor (Cameras): Secure the services of a Company Field Advisor from the Company producing the cameras for a minimum of 24 hours for the following:

Edit number of hours to suit.

Render advice regarding installation and final adjustment of the cameras.

Engineering associated with interconnections between the TVCPU and the cameras.

Render advice on the suitability of each camera, and lens for its particular application.

Assist in initial programming 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 maintenance personnel in operation, and routine maintenance of the cameras (minimum of 8 hours).

Edit number of hours to suit.

Explain available service programs to facility supervisory personnel for their consideration.

* + - 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:

One camera with zoom lens for outdoor camera station.

One camera with fixed focal length lens for outdoor camera station.

One outdoor camera housing with accessories.

One R/D control unit.

One pan/tilt unit (outdoor).

One video input module for TVCPU.

One video output module for TVCPU.

3 of each size fuse.

100 two hour cassettes for VCR.

One of each type optical fiber bi-directional transmitter.

One of each type optical fiber bi-directional receiver.

One optical fiber bi-directional transmitter power supply.

1. PRODUCTS
   * + 1. CONSOLE EQUIPMENT
          1. Television Central Processing Unit (TVCPU): American Dynamics' AD1650, or Burle Industries Inc.'s TC8501, having:

Power circuits suitable for operation on 120V ac primary (main) power supply.

Battery powered secondary (standby) power supply to operate portions of TVCPU as specified in SYSTEM DESCRIPTION.

Rack mounting capability.

Accessory Package For Programming TVCPU: Floppy discs and programming guides; American Dynamics' AD1650SW11, or Burle Industries Inc.'s TC8559MC.

* + - * 1. Alarm Interface Unit: American Dynamics' AD1696, or Burle Industries Inc.'s TC8540A.
        2. Signal Distribution Unit: American Dynamics' AD1691, or Burle Industries Inc.'s TC8568SD.
        3. Keyboard Control Unit: American Dynamics' AD1678CM, or Burle Industries Inc.'s TC8550KB.
        4. Video Cassette Recorders: Burle Industries Inc.'s TC3930:

Front loading.

VHS compatible in 2 hour mode.

Rack Mounting Kit: Burle Industries Inc.'s TC3901MK.

* + - * 1. Monitors:

Single 15 Inch Monitor: Burle Industries Inc.'s TC1115, rack mounted.

9 Inch Monitor: Burle Industries Inc.'s TC1910A (rack mounted, twin, for central monitoring console).

* + - * 1. Optical Fiber Bi-directional Receiver (OFBDR):

Fiber Options Inc.'s Model 242DR-R-M, for use where the total length of optical fiber circuit is less than 5000 feet.

Fiber Options Inc.'s Model 242DR-R-M/13, for use where the total length of optical fiber circuit is more than 5000 feet.

* + - * 1. Optical Fiber Receiver Rack (OFRR): Fiber Options Inc.'s 515R, having:

Central Power Supply for OFBDR's: 120 volt, 60 Hz input, output voltage as required for OFBDR's.

Filler plates for un-used portions of OFRR.

* + - * 1. Console Rack: Mount equipment in main security console (Section 281601).
      1. CAMERA STATIONS (OUTDOOR)
         1. Type O-FFLL (Outdoor-Fixed Focal Length Lens):

Camera: Burle Industries Inc.'s TC300E, having:

2/3 inch format, CCD image sensor.

Power circuit suitable for operation on 120V ac.

Line-Lock phase adjustment, which allows all cameras in the system to be synchronized for roll-free switching.

2/3 inch format, fixed focal length, auto iris lens (focal length and aperture as indicated on drawings).

Camera Housing: Weatherproof, environmental housing; Burle Industries Inc.'s TC9346-1T, having:

Capability of accepting camera/lens combinations of up to 5.98 inches high, by 7.25 inches wide, by 20 inches long.

Low temperature package, which maintains the internal temperature of the housing within camera and lens temperature ratings with the outside temperature down to minus 60 degrees F.

Power circuit suitable for operation on 120V ac.

Built-in receptacle for camera power.

Forward opening lid with gas spring assist.

Blower with thermostat.

Sunshield; Burle Industries Inc.'s SS5526.

Mounting accessories.

Weatherproof quick disconnect cable connectors to match connectors on incoming cables.

Optical Fiber Bi-directional Transmitter (OFBDT):

Fiber Options Inc.'s Model 242DT/M, for use where the total length of optical fiber circuit is less than 5000 feet.

Fiber Options Inc.'s Model 242DT-M/13, for use where the total length of optical fiber circuit is more than 5000 feet.

Power Supply for Optical Fiber Bi-directional Transmitter: Fiber Options Inc.'s Model 610-P.

Mounting Accessories: As required for mounting and support of components.

* + - * 1. Type O-Z/P/T (Outdoor-Zoom/Pan/Tilt):

Camera: Burle Industries Inc.'s TC300E, having:

2/3 inch format, CCD image sensor.

Power circuit suitable for operation on 120V ac.

Line-Lock phase adjustment, which allows all cameras in the system to be synchronized for roll-free switching.

Factory installed 1 inch format motorized zoom (15-180mm focal length, f/1.9 aperture) lens, with auto iris and pre-position options.

Pan/Tilt Unit: Weatherproof, medium duty outdoor pan and tilt driven unit; Burle Industries Inc.'s TC6570PT, having:

40 pound load capacity.

Power circuit suitable for operation on 120V ac.

Adjustable limit stops for both pan and tilt.

Preset position option.

Blanket and spot heaters for operation to minus 50 degrees F.

Mounting accessories.

Receiver/Driver Control Unit (R/D): Control unit for receiving and decoding signals from TVCPU and controlling camera station pan, tilt and lens functions; American Dynamics' AD1686, or Burle Industries Inc.'s TC8561, having:

Internal address coding switches.

Built-in electric heater, as required, for R/D operation to -40 degrees F.

NEMA 4 weatherproof housing.

Power circuit suitable for operation on 120V ac.

Minimum of 16 scene pre-positions.

Mounting accessories.

* + - * 1. Up to 3 auxiliary functions may be added (latching or momentary control points).

Optical Fiber Bi-directional Transmitter (OFBDT):

Fiber Options Inc.'s Model 242DT/M, for use where the total length of optical fiber circuit is less than 5000 feet.

Fiber Options Inc.'s Model 242DT-M/13, for use where the total length of optical fiber circuit is more than 5000 feet.

Power Supply for Optical Fiber Bi-directional Transmitter: Fiber Options Inc.'s Model 610-P.

Camera Housing: Weatherproof, environmental housing; Burle Industries Inc.'s TC9346-1T, having:

Capability of accepting camera/lens combinations of up to 5.98 inches high, by 7.25 inches wide, by 20 inches long.

Low temperature package, which maintains the internal temperature of the housing within camera and lens temperature ratings with the outside temperature down to minus 60 degrees F.

Power circuit suitable for operation on 120V ac.

Built-in receptacle for camera power.

Forward opening lid with gas spring assist.

Blower with thermostat.

Sunshield; Burle Industries Inc.'s SS5526.

Mounting accessories.

Weatherproof quick disconnect cable connectors to match connectors on incoming cables.

Mounting Accessories: As required for mounting and support of components.

* + - 1. CAMERA STATION POLES

Standard details available in office.

* + - * 1. Tapered (continuous or step taper) galvanized steel poles, having:

26 foot nominal height.

15 inch minimum bolt circle.

11 inch minimum shaft diameter at base (minimum 3 gage).

Bracket Arm: 6 feet long, 6 inch diameter, 7 gage minimum galvanized steel with:

Mounting plate at end for mounting camera station.

x 5 inch minimum handhole with reinforcing frame and cover located at outer end of arm.

3 x 5 inch minimum handhole with reinforcing frame and cover near top of pole.

4 x 8 inch minimum handhole near pole base with reinforcing frame and cover. Secure cover with vandal resistant screws.

Mounting plate on top of pole suitable for mounting camera station.

Four 1-1/2 inch diameter anchor bolts 60 inches long with 4 inch right angle leg. Threaded end hot dipped galvanized for minimum of 10 inches. Two galvanized nuts with each anchor bolt. Template for setting anchor bolts.

Pole construction suitable for a deflection rate of less than .26 inches per 100 lbs loading applied transversely 18 inches from top of pole.

* + - * 1. Acceptable Manufacturers: Carlan Mfg. Co. Inc., 601 Coates Ave., Holbrook, NY 11741, 516-567-2050.
      1. MOUNTING BRACKET
         1. Vicon Industries Inc.'s V36WM, having:

36 inch length.

Model V36S support strut.

Mounting hardware.

Galvanized span clamp for attaching support strut to pole.

* + - 1. REMOTE MONITOR/CONTROL JACK STATIONS
         1. Bulkhead type connectors mounted on Type 302 stainless steel, satin finish, wall plate for mounting on recessed 2 gang box.

Video Connector: BNC type.

Control Cable Connector: Pin configuration to suit control cable.

Include two articles below when 1.02 l. Is used.

* + - 1. MOBILE VIDEO CABINET
         1. Monitor: 15 inch monitor in desk top enclosure, Burle Industries Inc.'s TC1115.
         2. Video Cassette Recorder: Burle Industries Inc.'s TC3930.
         3. Keyboard Control Unit: American Dynamics' AD1678BM, or Burle Industries Inc.'s TC8550KB.
         4. Video Cabinet: Hand rubbed oak cabinet with slide out shelf (for keyboard, shelves for monitoring and VCR, locking doors, heavy duty casters; Winsted Corp.'s Model 37509.
         5. Accessories:

Multi outlet plug-in strip for monitor, VCR and keyboard control unit transformer.

Cables to interconnect monitor with VCR and remote jack.

Terminal block assembly, cables and connectors to connect keyboard control unit to remote jack.

* + - 1. SURGE SUPPRESSORS
         1. Equip system with surge suppressors to protect equipment from voltage transients and lightning surges (suitable for use with twisted pair wiring and coax wiring as required).
      2. WIRING
         1. Outdoor and Underground Cables:

Use two subparagraphs below if fiber optics are not being used.

Type VDO: RG-11U, flooded, coaxial type video cable with high density polyethylene jacket suitable for direct burial; Comm/Scope Inc.'s 0037, unless otherwise recommended by camera manufacturer.

For final connection to camera housing, provide RG-59U coaxial cable with stranded copper conductors suitable for continued flexing at all temperatures; Belden Corp.'s 9259, or Comm/Scope Inc.'s 5550. (Make transition to type VDO underground cable within camera station pole).

Type TVB: Shielded twisted pair of #18 AWG conductors, with high density polyethylene jacket suitable for direct burial; Belden Corp.'s 8760 (modified), or Tappan Wire & Cable Inc.'s 1802ATDB.

Use two subparagraphs below. If fiber optics are being used.

Type VDO: RG-59U coaxial cable with stranded copper conductors suitable for continued flexing at all temperatures; Belden Corp.'s 9259, or Comm/Scope Inc.'s 5550.

Type TVB: Shielded twisted pair of #18 AWG conductors; American Insulated Wire Corp.'s Specification 10061, Belden Corp.'s 8760, or Tappan Wire & Cable Inc.'s 1802AT.

Type CTRL (Control cables for camera lens and pan/tilt unit control); Belden Corp.'s 9886, Carol Cable Co. Inc.'s C6062, Quabbin Wire & Cable Co. Inc.'s 6175, or Tappan Wire & Cable Inc.'s 2050AT6DB:

Number, size, and type of conductors as recommended by the Company producing the equipment.

Conductors shall be enclosed in a cable with a jacket suitable for direct burial.

Optical Fiber Cables: Specified in Section 271524.

* + - 1. CONNECTORS
         1. Connectors: As produced by Amphenol Corp. (Weatherproof type where installed in exterior locations.)
      2. VIDEO SIGNAL INTEGRITY EQUIPMENT
         1. Video amplifiers, differential amplifiers, ground loop eliminators, etc., as required for proper signal transmission to produce sharp, clear, distortion free pictures on monitors.
      3. 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 engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.

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

Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

* + - 1. CONCRETE BASES
         1. As detailed on the drawings. Bases may be precast or poured in place.
      2. ACCESSORIES
         1. Include accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.

1. EXECUTION
   * + 1. INSTALLATION
          1. Install closed circuit television system in accordance with the Company's printed instructions and interconnect with perimeter security multiplex system (Section 281603) for a completely integrated system.
          2. Camera Station Poles:

Install each camera station pole on a concrete base.

Prepare a level surface on compacted earth, undisturbed earth or concrete footing. Set bases on the prepared surface. Have all bases checked and approved by the Director's Representative for level and elevation prior to making any conduit connections.

Install camera station poles vertical:

Use 2 nuts on each anchor bolt. Run first nut down on the thread to the top of the foundation.

Install pole, run second nut down.

Adjust pole if necessary, then tighten nuts in accordance with pole manufacturer's recommendations.

Grout voids between metal base of camera station poles and concrete base. Create a drain through the grout by slipping a short length of conduit under the base in the wet grout, projecting it into the large drain hole in the base of the camera station poles. Rotate the conduit to finish the drain, then remove conduit.

* + - * 1. Connections:

Make connections and splices at camera stations, fence accessory stations, and console only. Connections or splices will not be allowed at any other location in the system.

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

Use coaxial cable connectors for splicing and terminating coaxial cables. Use terminal strips for splicing and terminating other types of cable.

* + - * 1. Surge Suppressors: Install surge suppressors on each conductor entering and leaving console and fence accessory stations.
        2. Set the limit stops for the pan/tilt units as follows:

Set the tilt limit stops so that cameras can not be tilted above horizontal, to prevent accidental positioning of the cameras into the sun.

Set the pan limit stops to maximum pan or as directed.

* + - * 1. Nameplates:

Install nameplate at each camera station, indicating camera station number:

For wall mounted camera stations, install nameplate on camera station.

For pole mounted camera stations, install nameplate on pole.

For dedicated monitors, install nameplate over each monitor, indicating camera station that monitor is dedicated to.

Install nameplate stating monitor function over each monitor that is connected to the output of the TVCPU.

* + - 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:

Adjust each camera's imaging device position ("Back Focus Adjustment") in relationship with its lens to maximize the camera performance. Make adjustments at night (or during the day using a filter). Iris shall be fully open while adjusting the position of the imaging device in the camera. Exact method for adjustments shall be in accordance with the camera and lens manufacturers' printed instructions.

Make adjustments for clear, sharp, distortion free scenes and roll-free vertical interval switching to the satisfaction of the Director's Representative.

Aim fixed lens cameras as directed by Director's Representative.

If lens installed on camera does not adequately cover the area to be viewed by that camera, replace lens with a lens of a more suitable focal length at no addition cost.

Program system, including pre-position programming of each camera, as follows:

Pre-position No. 1: Camera lens at full wide angle with camera aimed to view perimeter zone(s) for which camera is automatically cued in pre-positions Nos. 2 and 3. With all cameras in pre-position No. 1, the entire perimeter shall be covered and automatic sequencing of cameras simulates a tour of the perimeter fence.

Pre-position Nos. 2 and 3: Camera aimed and adjusted to view the specific zone in alarm corresponding to the cuing schedule on the drawings.

Pre-position No. 4: Camera lens at full wide angle aimed at area below camera.

Pre-position No. 5: Camera lens at full zoom aimed at far end of zone covered in pre-position No. 1.

Pre-positions Nos. 6 thru 16: As directed.

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. Video Tape Test Recordings (Scenes):

After completion of the preliminary system test and prior to system acceptance test, make video tape recordings of the following scenes recorded from the cameras installed under this project:

During daylight with the cameras positioned in pre-position No. 1, consecutively sequence all cameras (with the dwell time set for each camera at 30 seconds) for a minimum period of 15 minutes or until all cameras have been viewed twice.

Same as item "a." above except recording shall be done at night.

30 seconds of each pre-positioned scene from each camera during daylight.

Record all pre-position scenes from one camera before recording from next camera.

The time it takes each camera, lens, and pan/tilt unit to adjust its position between each pre-position is not to be included in the 30 second period, but it to be recorded.

Include written description to accompany tape to identify each recorded scene.

Video tape recordings shall be suitable for playback on a standard VHS video cassette recording system.

Supply equipment necessary to make the video tape recordings.

* + - * 1. System Acceptance Test:

Prerequisite: Video Tape Test Recording of camera scenes must be approved prior to scheduling of the 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:

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

Demonstrate that:

Each camera station provides sharp, clear, distortion free scenes on the associated monitors for the lighting conditions.

Each outdoor camera station operates through a full range of lighting conditions including low lighting levels. A portion of this test must be performed at night.

Each camera operates through the full range of zoom lens.

Each camera housing operates through the full range of its pan and tilt capabilities.

Outdoor camera station mountings are stable in wind conditions at the site.

Supply 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 security console.

END OF SECTION 282301