

SECTION 282300 - VIDEO SURVEILLANCE

Last Update 5-7-2017 See underlined text for Edits.

(Engineer shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off all "Underlines".)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section and all other sections of Division 28.

1.2 SUMMARY

- A. Section includes a video surveillance system consisting of cameras, digital video recorder, data transmission wiring, and a control station with its associated equipment.
- B. Video surveillance system shall be integrated with monitoring and control system specified in Section 281600 "Intrusion Detection," and Section 281300 "Access Control," which specifies systems integration.
- C. Work includes, but not limited to the following:
 - 1. Install and integrate CCTV, and related security hardware.
 - 2. Configure local access panels in various closets and the Server's computer system to communicate with one another.
 - 3. Enter security system databases hardware configuration.
 - 4. Test security system communication and operation in accordance with the specification.
 - 5. Train operators and the system managers.
 - 6. Provide cameras, power supplies for cameras, and other CCTV equipment including DVRs.
- D. Bidding Requirements:
 - 1. Submit complete detailed proposals with line item cost representation for components and associated installation labor. Lump sum bids will not be accepted.
 - 2. Include as part of the bid response the following items:
 - 3. Installation schedule with proposed manpower assignments,
 - 4. Resumes for project manager and lead engineer for this project.

5. Review associated “E” and “TA” Series electrical, low voltage infrastructure drawings to verify that necessary conduit and floor boxes will be provided by others. The Owner will provide no additional infrastructure to support the Access Control Systems and Video Surveillance Systems. Any discrepancies with the identified infrastructure to support these systems should be questioned in the form of a request for information (RFI) during the bidding process. Be responsible for any additional infrastructure requirements after receipt of contract for this project.
 6. Unspecified Equipment and Material: Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide complete and functional Access Control Systems and Video Surveillance Systems shall be provided in a level of quality consistent with other specified items.
- E. Complete Engineering, installation, programming and maintenance of the security system for the <Insert Project/Building Name>. This system will consist of CCTV (Intellex) systems.

1.3 DEFINITIONS

- A. AGC: Automatic gain control.
- B. BNC: Bayonet Neill-Concelman - type of connector.
- C. B/W: Black and white.
- D. CCD: Charge-coupled device.
- E. FTP: File transfer protocol.
- F. IP: Internet protocol.
- G. LAN: Local area network.
- H. MPEG: Moving picture experts group.
- I. NTSC: National Television System Committee.
- J. PC: Personal computer.
- K. PTZ: Pan-tilt-zoom.
- L. RAID: Redundant array of independent disks.
- M. TCP: Transmission control protocol - connects hosts on the Internet.
- N. UPS: Uninterruptible power supply.

- O. WAN: Wide area network.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide and install American Dynamics zoom, tilt and pan controllers for all of the cameras capable of such functions or approved equal.
- B. Provide as shown on drawings quantity of Intellex DVR units, cameras, mounts, and controls.
- C. Also, provide and install equipment vertical racks as required to hold the DVRs and other equipment.
- D. All programming of all systems hardware is by the security contractor. A two year full parts and labor warranty is specified. Note that the full one year parts and labor warranty is unconditional and covers all portions of this system from failure, except for acts of God or misuse by the owner. During this one-year period, the security contractor must meet the following performance requirements:
 - 1. Respond Onsite Within Two (2) Hours to Four (4) Hours
 - 2. Advanced Loaners
 - 3. Computerized Dispatch
 - 4. Service technicians certified on Lenel systems and products.
 - 5. Available seven (7) days a week, twenty four (24) hours a day.
- E. Four hours of battery back-up is required on all access control panels.

1.5 CONTRACTOR PERFORMANCE REQUIREMENTS

- A. Technical Personnel: The contractor shall have adequate technical staff located within thirty (30) miles of the university. At minimum, the contractor shall have at least twenty five (25) employees that are locally based in the Baltimore-Washington corridor.
- B. Working Hours Response: During normal working hours, all telephone calls placed to the contractor shall be answered by a live person, not an auto-attendant.
- C. Service Dispatch: The contractor shall use a computerized service dispatch system that is a commercial off-the-shelf product used for dispatching service companies. At the end of every week, the contractor will be required to email the hospital a list of all service calls and their status on an automatic basis. Excel spreadsheets are not acceptable for a service dispatch program.
- D. The contractor shall have a dedicated position specifically for managing and dispatching service calls for their clients. This position shall perform no other functions except service-related dispatch functions and services.

- E. Engineering: The contractor must have field-trained engineers on staff that are 100% conversant in AutoCAD and are able to provide the necessary electronic drawings and submittals required for a project of this size. The engineer must also be certified at the Master level in Lenel.
- F. Contractor must meet all security clearance requirements to meet NBHPP CHEMPAK standards.
- G. The contractor must be a certified dealer of all products utilized in the system to include: Lenel, American Dynamics, Aiphone, Code Blue, HID, Pelco.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include dimensions and data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For video surveillance. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
 - 3. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
 - 4. UPS: Sizing calculations.
 - 5. Wiring Diagrams: For power, signal, and control wiring.
- C. Equipment List: Include every piece of equipment by model number, manufacturer, serial number, location, and date of original installation. Add pretesting record of each piece of equipment, listing name of person testing, date of test, set points of adjustments, name and description of the view of preset positions, description of alarms, and description of unit output responses to an alarm.

1.7 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For video surveillance, cameras, camera-supporting equipment, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Field quality-control reports.
- C. Warranty: Sample of special warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For cameras, power supplies, infrared illuminators, monitors, videotape recorders, digital video recorders, video switches, and control-station components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 1. Lists of spare parts and replacement components recommended to be stored at the site for ready access.

1.9 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NECA 1, Standard Practices for Good Workmanship in Electrical Construction.
- C. Comply with NFPA 70, National Electrical Code.
- D. FCC – Part 68, Connection of Terminal Equipment to the Telephone Network.
- E. IEEE, Institution of Electrical and Electronics Engineers.
- F. Microsoft® Open Database Connectivity (ODBC) interface
- G. ISO Software Coding Standards for C++ and C##
- H. RoHS, Reduction of Hazardous Substances.
- I. EIA/TIA-170A, Electrical Performance Standard for Color Television.
- J. Electronic data exchange between video surveillance system with an access-control system shall comply with SIA TVAC.
- K. Where products are specified by name, provide and install that product. Substitutions will not be accepted for the access control or digital CCTV system or their sub-systems.

1.10 PROJECT CONDITIONS

- A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Control Station: Rated for continuous operation in ambient temperatures of 60°F to 85°F and a relative humidity of 20% to 80%, non-condensing.
 2. Interior, Controlled Environment: System components, except central-station control unit, installed in temperature-controlled interior environments shall be rated for continuous operation in ambient temperatures of 36°F to 122°F dry bulb and 20% to 90% relative humidity, non-condensing. Use NEMA 250, Type 1 enclosures.
 3. Interior, Uncontrolled Environment: System components installed in non-temperature-controlled interior environments shall be rated for continuous operation in ambient temperatures of 0°F to 122°F dry bulb and 20% to 90% relative humidity, non-condensing. Use NEMA 250, Type 12 enclosures.
 4. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambient temperatures of - 30°F to +122°F dry bulb and 20% to 90% relative humidity, condensing. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to eighty five (85) mph and snow cover up to twenty four (24) inches thick. Use NEMA 250, Type 4X enclosures.
 5. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers shall be rated, listed, and installed according to NFPA 70.
 6. Corrosive Environment: System components subject to corrosive fumes, vapors, and wind-driven salt spray in coastal zones. Use NEMA 250, Type 4X enclosures.
 7. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.

1.11 WARRANTY/GUARANTEE

- A. See Division 26 Specification Section “Basic Electrical Requirements’ for warranty and guarantee requirements.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of cameras, equipment related to camera operation, and control-station equipment that fail in materials or workmanship within specified warranty period.
1. During the first year, provide a full service warranty program that guarantees a two to four hour on-site response, include all parts and labor, and provides advance replacements for any defective components. The installation contractor must qualify as the service organization and provide the on-site warranty service.

2. The system components shall be guaranteed against all defective materials, design and workmanship for a period of two-year from the date of acceptance by the client after final testing. New replacement parts shall be furnished promptly and defects in design and workmanship shall be corrected, without cost to the Owner, promptly upon receipt of notice from the Owner of failure of any part of the system during the guarantee period. This is a one year full parts and labor warranty and no alternative will be acceptable.
3. Any item failing before the one year guarantee period expires shall be replaced and the guarantee extended for that item for twelve months from the replacement date of the item.
4. The warranty period for any part which has a warranty by the manufacturer of longer than twelve (12) months shall be for the longer period. Provide a copy of the manufacturer's warranty period statement for all alarm equipment, all software, all major CCTV components, and other major devices.

PART 2 - PRODUCTS

2.1 SYSTEM REQUIREMENTS

- A. Video-signal format shall comply with NTSC standard, composite interlaced video. Composite video-signal termination shall be 75 ohms.
- B. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor's entry connection to components.
 1. Minimum Protection for Power Connections 120 V and More: Auxiliary panel suppressors complying with requirements in Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits."
 2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with requirements in Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits" as recommended by manufacturer for type of line being protected.
- C. Tamper Protection: Tamper switches on enclosures, control units, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled. Control-station, control-unit alarm display shall identify tamper alarms and indicate locations.

2.2 STANDARD CAMERAS

- A. The indoor/outdoor integrated CCTV camera and enclosure shall consist of a tamper/impact resistant, in-ceiling mountable dome enclosure with integrated fixed

camera and lens. The integrated camera and lens shall consist of a camera and lens module that is packaged separately for shipment and which shall allow the installation of the enclosure to precede installation of the camera and lens.

- B. The tamper/impact resistant dome enclosure shall meet or exceed the following design and performance specifications:
1. The enclosure shall be easy to install, requiring only standard tools.
 2. The tamper/impact resistant dome enclosure shall have the following external dimensions: overall height, when installed, shall not exceed 2.6 inches, and enclosure diameter shall not exceed 5.5 inches.
 3. The enclosure back box, when installed, shall not require more than 1.75 inches of space inside a wall or ceiling.
 4. Tamper resistant, pin-in-hex screws and tightening tool shall be provided to secure the cover assembly to the enclosure body.
 5. The dome shall consist of 3.75-inch diameter, .125-inch thick polycarbonate high security bubble that has high optical clarity and nominal distortion at all camera angles.
 6. The bubble shall be puncture-proof, capable of withstanding pointed impact forces of 35 foot-pounds without creating an internal depression greater than 0.2 inches.
 7. The bubble shall be impact resistant, capable of withstanding repeated multiple blunt impact forces up to one hundred (100) foot-pounds.
 8. The dome shall be available in clear or smoked versions. The smoked version shall have a maximum light loss not greater than 1.5 f-stops.
 9. The enclosure shall be NEMA 4 and IP 66 rated, when installed.
 10. The enclosure shall be suitable for use in environmental air handling spaces.
 11. The enclosure, when loaded with camera and integrated low temperature resistor array, shall be capable of operation down to -50°F .
 12. The enclosure, when loaded with camera and integrated low temperature resistor array, shall be capable of de-icing the viewing surface of the enclosure down to -10°F .
 13. The enclosure shall be provided with an adapter plate for mounting to a standard 4S or double-gang electrical box or which can be used as a backing flange when mounting to a drop ceiling.
 14. A clearly labeled pigtail shall be provided for connecting 12 VDC or 24 VAC power.
 15. A male pigtail BNC connector shall be provided for connecting video.
 16. The enclosure, when loaded with camera and integrated low temperature resistor array, at temperatures above 35°F , shall consume less than 2 watts of power.
 17. The enclosure, when loaded with camera and integrated low temperature resistor array, at temperatures under 35°F , shall consume no more than 13 watts of power.
 18. The enclosure, when installed, shall have no exposed cables.

-
- C. The integrated camera and lens assembly shall consist of a charge-coupled device (CCD) camera with fixed focal length or varifocal lens that is mounted as an easily installable/removable module.
1. The CCD camera shall consist of either a one quarter (1/4) inch or one third (1/3) inch format interline transfer imager meeting NTSC (EIA) or PAL (CCIR) signal format specifications.
 2. The cameras shall be available in either standard resolution monochrome capable of 420 TV lines of horizontal resolution, standard resolution color capable of 350 TV lines of horizontal resolution, or high resolution color capable of 470 lines of horizontal resolution.
 3. The fixed focal length lenses available shall be 2.9mm, 6mm, 8mm, or 12mm. All cameras with fixed focal length lenses shall utilize one third (1/3) inch CCD imagers.
 4. The high resolution color camera shall be available with a 2.6mm to 5.6mm varifocal length lens with on/off DIP switch for auto iris capability. This camera shall utilize a 1/4-inch CCD imager.
 5. All cameras, including the one quarter (1/4) inch CCD with varifocal lens, shall be capable of electronic light control, commonly referred to as electronic shutter.
 6. All color cameras shall be 2:1 interlace and capable of AC line lock that is adjustable via potentiometer on the camera board.
 7. A jumper shall be provided on the power supply board for configuring to either 12 VDC or 24 VAC power.
 8. All cameras shall be protected from incorrect placement of the 12 VDC/24 VAC jumper.
- D. The camera module shall meet or exceed the following design and performance specifications:
1. The camera module shall have two spring steel, compressible arms that create an interference fit that holds the module in place.
 2. During installation and camera adjustment, the module design shall allow adjustment of the camera on three axes to allow maximum flexibility during scene adjustment.
 3. The three axes shall be pan, tilt, and rotation.
 4. The camera and lens, when installed on a ceiling or horizontal surface, shall be capable of 360 degrees of pan and no less than 70 degree of tilt. When field of view is factored, apparent tilt shall be no less than 90 degree.
 5. The camera and lens, when installed on a wall or vertical surface, shall be capable of 180 degrees of pan and no less than 140 degree of tilt.
 6. The camera module shall consist of the camera, lens, low temperature array, and 24 VAC power supply board.
 7. The camera module shall be easy to install by being provided with a quick connect/disconnect connector.

8. The removable camera module shall allow unrestricted access to the inside of the enclosure during installation of the enclosure.
- E. The indoor/outdoor integrated CCTV camera and in-ceiling mountable dome enclosure shall be provided with a manufacturer's warranty covering repair or replacement of defective parts for a period of two years from the date of shipment.
- F. The indoor/outdoor integrated CCTV camera and in-ceiling mountable dome enclosure shall be the Pelco ICS150 Series Camclosure or approved equal.

2.3 POWER SUPPLIES

- A. Low-voltage power supplies matched for voltage and current requirements of cameras and accessories, and of type as recommended by manufacturer.
- B. All cameras will be powered by a central power supply and rack mounted. It shall be an Altronix R2416300ULCB or approved equal.
- C. Power reader and alarm controllers from power provided. All power shall be hard-wired into the access control panels and power supplies. Plug-in receptacles are not acceptable.
- D. The system data gathering panel control units shall be capable of operation for a period of no less than 4 hours with its standby battery system.
- E. Power Supplies: Transformers and power supplies shall be provided for detectors, panels, and accessories. Power supplies shall meet or exceed the manufacturer's recommendations for individual devices served and shall be rated at 150% of the peak load as though all circuits are connected to motion detectors.
- F. Battery Back-up: Stand-by batteries with charger shall power microprocessor-based units, controllers, and control panels and detectors in the event of a primary power failure. Batteries shall be sized to provide 150% capacity for four hours. An alarm shall be initiated upon failure of battery and/ or primary power.
- G. Protect all equipment from surges and noise Provide grounding as per the manufacturer's requirements for the system provided or for the components used.
- H. Lock power supply interface to fire control system to be provided and installed by others

2.4 CAMERA-SUPPORTING EQUIPMENT

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:

1. Bosch Security Systems, Inc.
 2. CBC (AMERICA) Corp.
 3. COP-USA.
 4. Crest Electronics, Inc.
 5. Elbex Ltd.; Elbex America Inc.
 6. ELMO.
 7. EverFocus Electronics Corporation.
 8. GENWAC; a brand of Watec Cameras.
 9. GE Security, Inc.
 10. Honeywell International Inc.; Honeywell Video Systems.
 11. Ikegami Electronics (USA) Inc.
 12. Merit Li-Lin (USA) Corp.
 13. Panasonic Corporation of North America; Panasonic Security Systems.
 14. Pelco.
 15. Samsung Opto-Electronics.
 16. SANYO North America Corporation.
 17. Telpix Electronics, Inc.
 18. Tyco International Limited; Sensormatic products.
 19. VELTEK.
 20. Vicon Industries, Inc.
 21. Videolarm.
 22. Video Mount Products.
 23. Visiontech.
 24. Wren Associates Limited.
- B. Pan Units: Motorized automatic-scanning units arranged to provide remote-controlled manual and automatic camera panning action, and equipped with matching mounting brackets.
1. Scanning Operation: Silent, smooth, and positive.
 2. Stops: Adjustable without disassembly, to limit the scanning arc.
- C. Pan-and-Tilt Units: Motorized units arranged to provide remote-controlled aiming of cameras with smooth and silent operation, and equipped with matching mounting brackets.
1. Panning Rotation: 0 to 355 degrees, with adjustable stops.
 2. Tilt Movement: 90 degrees, plus or minus 5 degrees, with adjustable stops.
 3. Speed: 12 degrees per second in both horizontal and vertical planes.
 4. Wiring: Factory prewired for camera and zoom lens functions and pan-and-tilt power and control.
 5. Built-in encoders or potentiometers for position feedback.
 6. Pan-and-tilt unit shall be available with preset positioning capability to recall the position of a specific scene.

- D. Mounting Brackets for Fixed Cameras: Type matched to items supported and mounting conditions. Include manual pan-and-tilt adjustment.

2.5 MONITORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Bosch Security Systems, Inc.
2. CBC (AMERICA) Corp.
3. COP-USA.
4. GE Security, Inc.
5. Hitachi, Ltd.
6. Honeywell International Inc.; Honeywell Video Systems.
7. Panasonic Corporation of North America; Panasonic Security Systems.
8. Pelco.
9. Samsung Opto-Electronics.
10. SANYO North America Corporation.
11. Toshiba Corporation; Surveillance products.
12. Tyco International Limited; Sensormatic products.
13. VELTEK.
14. Vicon Industries, Inc.

- B. Monochrome:

1. Metal cabinet units designed for continuous operation.
2. Screen Size (Diagonal Dimension): Twenty four (24) inch.
3. Horizontal Resolution: Six hundred (600) lines, minimum, at center.
4. Minimum Front Panel Devices and Controls: Power switch; power-on indicator; and brightness, horizontal-hold, vertical-hold, and contrast controls.
5. Mounting: Adjustable tilting and training.
6. Mounting: Dual, nine (9) inch, vertical, EIA nineteen (19) inch electronic equipment rack or cabinet complying with CEA 310-E.
7. Electrical: 120-V ac, 60 Hz.

- C. Color:

1. Metal cabinet units designed for continuous operation.
2. Screen Size (Diagonal Dimension): Twenty four (24) inch.
3. Horizontal Resolution: Three hundred (300) lines.
4. Minimum Front Panel Devices and Controls: Power switch; power-on indicator; and brightness, contrast, color, and tint controls.
5. Degaussing: Automatic.
6. Mounting: Dual, nine (9) inch, vertical, EIA nineteen (19) inch electronic equipment rack or cabinet complying with CEA 310-E.

7. Electrical: 120-V ac, 60 Hz.

2.6 DIGITAL VIDEO RECORDERS

- A. The video from the different cameras will be fed into a digital video recorder (DVR). The DVR shall meet the following requirements:
 1. Be an off-the-shelf product. The manufacturer of the DVR shall have a track record of successfully manufacturing and supporting DVRs in the market for a minimum of four years.
 2. Use Windows 2000 as an operating system. Embedded units using proprietary software are not acceptable.
 3. Use a GUI interface, and be mouse driven. The unit should also be easy to use, with all programming accomplished by a mouse.
 4. Integrate with the access control system. Integration means that the access control workstation shall be able to review live as well as recorded information. It also means that a video clip will be associated with any and all alarms. Clicking on the video icon on the access control workstation will automatically playback that video clip for review by authorized personnel.
 5. Incorporate an integral CDRW.
 6. Include a UPS system for power conditioning as well as a separate monitor for programming.
 7. Include the necessary equipment for rack mounting.
 8. Have software that uses features such as smart search or rapid search. This enables the user to select a specific part of a screen for motion activity for recall at a later date.
 9. Support up to sixteen (16) cameras.
 10. Record images at a rate of one hundred twenty (120) images per second, recording up to four weeks of information.
 11. Be programmable such that the hospital has the option to only record motion on a selected basis.
 12. The DVR will be the Intellex ADD6R0DVD050 equipped with a 500GB hard drive or approved equal.
 13. All DVRs and camera power supplies will be centrally located.

2.7 NETWORK VIDEO RECORDERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
 1. AXCESS International Inc.
 2. Bosch Security Systems, Inc.
 3. GE Security, Inc.
 4. Hitachi, Ltd.

5. Honeywell International Inc.; Honeywell Video Systems.
6. JVC Americas Corp.; JVC Professional products.
7. Panasonic Corporation of North America; Panasonic Security Systems.
8. Pelco.
9. Samsung Opto-Electronics.
10. SANYO North America Corporation.
11. Tyco International Limited; Sensormatic products.
12. Vicon Industries, Inc.

B. External storage or internal 250-1, 500-GB hard disk drive.

1. Video and audio recording over TCP/IP network.
2. Video recording of MPEG-2 and MPEG-4 streams.
3. Video recording up to 48 Mbps for internal storage and up to 100 Mbps for external storage.
4. Duplex Operation: Simultaneous recording and playback.
5. Continuous and alarm-based recording.
6. Full-Featured Search Capabilities: Search based on camera, time, or date.
7. Automatic data replenishment to ensure recording even if network is down.
8. Digital certification by watermarking.
9. Internal RAID storage or non-RAID storage of up to 1500 GB.
10. Capable of adding external RAID storage up to 7000 GB for models with no internal storage.
11. Full integration with LAN, Intranet, or Internet through standard Web browser or video management software.
12. Integrated Web server FTP server functionality.
13. Supports up to sixteen (16), thirty two (32), or sixty four (64) devices.

2.8 DIGITAL SWITCHERS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. AXCESS International Inc.
2. Bosch Security Systems, Inc.
3. GE Security, Inc.
4. Honeywell International Inc.; Honeywell Video Systems.
5. Hunt Electronics USA, Inc.
6. Panasonic Corporation of North America; Panasonic Security Systems.
7. Pelco.
8. Samsung Opto-Electronics.
9. SANYO North America Corporation.
10. Toshiba Corporation; Surveillance products.
11. Tyco International Limited; Sensormatic products.
12. Vicon Industries, Inc.

-
- B. Quad Switch: For displaying images from four cameras on a single monitor. Provide color switcher if one or more cameras or monitors are in color.
1. Controls: Unit-mounted front panel.
 2. Resolution: Seven hundred twenty (720) by four hundred eighty (480) lines.
 3. Modes: Auto, manual, and alarm. In manual mode, each channel can also be viewed in single display mode. In the event of an alarm, alarming channel shall automatically switch to full screen. If several alarms are activated, channels in alarm shall be in auto-switching mode.
 4. Channel Loss Alarm: Audible buzzer; occurrence details shall be recorded.
 5. Time: Indicate date and time.
 6. Timing of Auto-Switcher: One (1) second to thirty (30) seconds, selectable.
 7. Mounting: Standard nineteen (19) inch rack complying with CEA 310-E, or freestanding desktop.
- C. Manual Switch Bank: Low-loss, high-isolation, multiple-video switch to allow manual switching of multiple quad switches and cameras to a single output. Switches shall be illuminated.
- D. Sequential Switchers: Automatically sequence outputs of multiple cameras to single monitor and videotape recorder.
1. Switching Time Interval: Continuously adjustable, five (5) seconds to twenty (20) seconds minimum, with manual override.
 2. Skip-Sequential-Hold Switch: One (1) for each camera, with LED to indicate active camera.
 3. Camera Identification Legend: Either on-screen message or label at skip-sequential switch.
 4. Alarm Switching: In the event of an alarm, alarming channel shall automatically switch the monitor to full screen.
 5. Mounting: Standard nineteen (19) inch rack complying with CEA 310-E.
- E. PTZ Controls: Arranged for multiple-camera control, with switches to select camera to be controlled.
1. Pan-and-Tilt Control: Joystick type.
 2. Zoom Control: Momentary-contact, "in-out" push button.
 3. Automatic-Scan Control: A push button for each camera with pan capability that places camera in automatic-scanning mode.

2.9 IP VIDEO SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. AXCESS International Inc.
2. Bosch Security Systems, Inc.
3. CBC (AMERICA) Corp.
4. GE Security, Inc.
5. Hitachi, Ltd.
6. Honeywell International Inc.; Honeywell Video Systems.
7. Panasonic Corporation of North America; Panasonic Security Systems.
8. Pelco.
9. Samsung Opto-Electronics.
10. SANYO North America Corporation.
11. Tyco International Limited; Sensormatic products.
12. Vicon Industries, Inc.

B. Description:

1. System shall provide high-quality delivery and processing of IP-based video, audio, and control data using standard Ethernet-based networks.
2. System shall have seamless integration of all video surveillance and control functions.
3. Graphical user interface software shall manage all IP-based video matrix switching and camera control functions, two-way audio communication, alarm monitoring and control, and recording and archive/retrieval management. IP system shall also be capable of integrating into larger system environments.
4. System design shall include all necessary compression software for high-performance, dual-stream, MPEG-2/MPEG-4 video. Unit shall provide connections for all video cameras, camera PTZ control data, bidirectional audio, discreet sensor inputs, and control system outputs.
5. All camera signals shall be compressed, encoded, and delivered onto the network for processing and control by the IP video-management software.
6. Camera system units shall be ruggedly built and designed for extreme adverse environments, complying with NEMA Type environmental standards.
7. Encoder/decoder combinations shall place video, audio, and data network stream that can be managed from multiple workstations on the user's LAN or WAN.
8. All system interconnect cables, workstation PCs, PTZ joysticks, and network intermediate devices shall be provided for full performance of specified system.

2.10 SIGNAL TRANSMISSION COMPONENTS

- A. Cable: Coaxial cable elements have 75-ohm nominal impedance. Comply with requirements in Section 280513 "Conductors and Cables for Electronic Safety and Security."
- B. Video Surveillance Coaxial Cable Connectors: BNC type, 75 ohms. Comply with requirements in Section 280513 "Conductors and Cables for Electronic Safety and Security."

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate layout and installation of Video Surveillance Systems equipment with Owner's security representative.
 - 1. Meet jointly with Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute them to other participants.
- B. Coordinate layout and installation of the Video Surveillance Systems cable pathways with telecommunications contractor.

3.2 EXAMINATION

- A. Examine pathway elements intended for cables. Check raceways and other elements for compliance with space allocations, installation tolerance, hazards to camera installation, and other conditions affecting installation.
- B. Examine roughing-in for LAN, WAN, and IP network before device installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 WIRING

- A. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems."
- B. Wiring Method: Install cables in raceways unless otherwise indicated.
 - 1. Conceal raceways and wiring except in unfinished spaces.
- C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

- E. For LAN connection and fiber-optic and copper communication wiring, comply with Section 271300 "Communications Backbone Cabling" and Section 271500 "Communications Horizontal Cabling."
- F. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.4 VIDEO SURVEILLANCE SYSTEM INSTALLATION

- A. Install cameras and infrared illuminators level and plumb.
- B. Install cameras with eighty four (84) inch minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.
- C. Set pan unit and pan-and-tilt unit stops to suit final camera position and to obtain the field of view required for camera. Connect all controls and alarms, and adjust.
- D. Install power supplies and other auxiliary components at control stations unless otherwise indicated.
- E. Install tamper switches on components indicated to receive tamper switches, arranged to detect unauthorized entry into system-component enclosures and mounted in self-protected, inconspicuous positions.
- F. Avoid ground loops by making ground connections only at the control station.
 - 1. For 12- and 24-V dc cameras, connect the coaxial cable shields only at the monitor end.
- G. Identify system components, wiring, cabling, and terminals according to Section 260553 "Identification for Electrical Systems."

3.5 SERVICE AND MAINTENANCE

- A. Owner's security personnel in operation and management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of access assignments and revisions when extending elements to establish new access outlets.
- B. General Requirements: Provide all services required and equipment necessary to maintain the entire SMS in an operational state as specified for a period of two (2) year(s) after formal written acceptance of the system, and shall provide all necessary material required for performing scheduled service or other unscheduled work.

- C. Description of Work: The service and repair of the SMS including all equipment provided under this specification supplied by the successful contractor. Provide the manufacturer's required scheduled and unscheduled maintenance and all other work necessary to keep the SMS at its maximum performance.
- D. Personnel: Service personnel shall be factory certified in the maintenance and repair of the equipment installed under this section of the specification. The owner shall be advised in writing of the name of the designated service representative, and of any change in personnel.
- E. Schedule of Work: This work shall be performed during regular working hours (8-5), Monday through Friday, excluding federal holidays.
1. Inspections: The Contractor shall perform two (2) minor inspections at six (6) month intervals (or more often if required by the manufacturer), and two (2) major inspections offset equally between the minor inspections to effect quarterly inspection of alternating magnitude.
 2. Minor Inspections: These inspections shall include:
 - a. Visual checks and operational tests of all console equipment, peripheral equipment, field hardware, sensors, and electrical and mechanical controls.
 - b. Mechanical adjustments if required on any mechanical or electromechanical devices
 3. Major Inspections: These inspections shall include all work described under paragraph Minor Inspections and the following work:
 - a. Clean all SMS equipment, including interior and exterior surfaces.
 - b. Perform diagnostics on all equipment.
 - c. Check, walk test, and if required by the manufacturer's maintenance procedures, calibrate each sensor.
 - d. Run all system software diagnostics and correct all diagnosed problems.
- F. Operation: Performance of scheduled adjustments and repair shall verify operation of the SMS as demonstrated by the applicable tests of the performance verification test.
- G. Emergency Service: The owner will initiate service calls when the SMS is not functioning properly and hinders critical operation of the facility. Qualified personnel shall be available to provide service to the complete SMS repairs. The owner shall be furnished with a telephone number where the service supervisor can be reached at all times. Service personnel shall be at site within four (4) hours after receiving a request for service. The SMS shall be restored to proper operating condition within eight (8) hours after service personnel arrive on site.

- H. Records and Logs: Keep records and logs of each task, and shall organize cumulative records for each component, and for the complete system chronologically. A continuous log shall be maintained for all devices. The log shall contain all initial settings. Complete logs shall be kept and shall be available for inspection on site, demonstrating that planned and systematic adjustments and repairs have been accomplished for the SMS.
- I. Work Requests: Separately record each service call request on a service request form. The form shall include the model and serial number identifying the component involved, its location, date and time the call was received, specific nature of trouble, names of service personnel assigned to the task, instructions describing what has to be done, the amount and nature of the materials used, the time and date work started, and the time and date of completion. Deliver a record of the work performed within five (5) days after work is accomplished.
- J. System Modifications: Make any recommendations for system modification in writing to the Owner. No system modifications, shall be made without prior approval of the Owner. Any modifications made to the system shall be incorporated into the operations and maintenance manuals, and other documentation affected.
- K. Software: Provide all software updates during the period of the warranty and verify operation in the system. These updates shall be accomplished in a timely manner, fully coordinated with SMS operators, shall include training for the new changes/features enabled, and shall be incorporated into the operations and maintenance manuals, and software documentation.

3.6 DEVICE WIRING AND COMMUNICATION CIRCUIT SURGE PROTECTION

- A. All inputs shall be protected against surges induced on device wiring. Outputs shall be protected against surges induced on control and device wiring installed outdoors and as shown. All communications equipment shall be protected against surges induced on any communications circuit. All cables and conductors, except fiber optics, which serve as communications circuits from security console to field equipment, and between field equipment, shall have surge protection circuits installed at each end.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Tests and Inspections:

1. Inspection: Verify that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
2. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video-surveillance equipment for acceptance and operational testing as follows:
 - a. Prepare equipment list described in "Informational Submittals" Article.
 - b. Verify operation of auto-iris lenses.
 - c. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
 - d. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object fifty (50) to seventy five (75) feet away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
 - e. Set and name all preset positions; consult Owner's personnel.
 - f. Set sensitivity of motion detection.
 - g. Connect and verify responses to alarms.
 - h. Verify operation of control-station equipment.
3. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least fourteen (14) days. Provide a minimum of ten (10) days' notice of test schedule.
4. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.

E. Video surveillance system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.8 ADJUSTING

- A. Occupancy Adjustments: When requested within [twelve (12)] <Insert number> months of date of Substantial Completion, provide on-site assistance in adjusting system to suit

actual occupied conditions. Provide up to [two (2)] <Insert number> visits to Project during other-than-normal occupancy hours for this purpose. Tasks shall include, but are not limited to, the following:

1. Check cable connections.
2. Check proper operation of cameras and lenses. Verify operation of auto-iris lenses and adjust back-focus as needed.
3. Adjust all preset positions; consult Owner's personnel.
4. Recommend changes to cameras, lenses, and associated equipment to improve Owner's use of video surveillance system.
5. Provide a written report of adjustments and recommendations.

3.9 CLEANING

- A. Clean installed items using methods and materials recommended in writing by manufacturer.
- B. Clean video-surveillance-system components, including camera-housing windows, lenses, and monitor screens.

3.10 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain video-surveillance equipment.

END OF SECTION 282300