SECTION 28 23 00
VIDEO SURVEILLANCE

PART 1 – GENERAL

1.1 DESCRIPTION

A. Provide and install a complete Video Surveillance System, which is identified as the Video Assessment and Surveillance System hereinafter referred to as the VASS System as specified in this section.

B. This Section includes video surveillance system consisting of cameras, data transmission wiring, and a control station with its associated equipment.

C. Video surveillance system Video assessment & surveillance system shall be integrated with monitoring and control system specified in Division 28 Section [INTRUSION DETECTION] [PHYSICAL ACCESS CONTROL] [SECURITY ACCESS DETECTION] [ELECTRONIC PERSONAL PROTECTION SYSTEM] that specifies systems integration.

1.2 RELATED WORK

A. Section 01 00 00 - GENERAL REQUIREMENTS. For General Requirements.

B. Section 07 84 00 - FIRESTOPPING. Requirements for firestopping application and use.

C. Section 10 14 00 - SIGNAGE. Requirements for labeling and signs.

D. Section 14 21 00 - ELECTRIC TRACTION ELEVATORS. Requirements for elevators.

E. Section 14 24 00 - HYDRAULIC ELEVATORS. Requirements for elevators.

F. Section 26 05 11 - REQUIREMENTS FOR ELECTRICAL INSTALLATIONS. Requirements for connection of high voltage.

G. Section 26 05 21 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW). Requirements for power cables.

H. Section 26 05 41 - UNDERGROUND ELECTRICAL CONSTRUCTION. Requirements for underground installation of wiring.

I. Section 26 56 00 - EXTERIOR LIGHTING. Requirements for perimeter lighting.

J. Section 28 05 00 – COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY. Requirements for general requirements that are common to more than one section in Division 28.

K. Section 28 05 13 - CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY. Requirements for conductors and cables.

L. Section 28 05 26 - GROUNDING AND BONDING FOR ELECTRONIC SAFETY AND SECURITY. Requirements for grounding of equipment.

M. Section 28 05 28.33 - CONDUITS AND BACKBOXES FOR ELECTRONIC SAFETY AND SECURITY. Requirements for infrastructure.

N. Section 28 08 00 - COMMISIONING OF ELECTRONIC SAFETY AND SECURITY. Requirements for commissioning, systems readiness checklists, and training.

O. Section 28 13 00 - PHYSICAL ACCESS CONTROL SYSTEM. Requirements for physical access control system integration.

P. Section 28 13 16 - PHYSICAL ACCESS CONTROL SYSTEM AND DATABASE MANAGEMENT. Requirements for control and operation of all security systems.

Q. Section 28 13 53 - SECURITY ACCESS DETECTION. Requirements for screening of personnel and shipments.

R. Section 28 16 00 - INTRUSION DETECTION SYSTEM (IDS). Requirements for alarm systems.

S. Section 28 26 00 - ELECTRONIC PERSONAL PROTECTION SYSTEM (EPPS). Requirements for emergency and interior communications.

1.3 DEFINITIONS

A. AGC: Automatic gain control.

B. B/W: Black and white.

C. CCD: Charge-coupled device.

D. CIF: Common Intermediate Format CIF images are 352 pixels wide and 88/240 (PAL/NTSC) pixels tall (352 x 288/240).

E. 4CIF: resolution is 704 pixels wide and 576/480 (PAL/NTSC) pixels tall (704 x 576/480).

F. H.264 (also known as MPEG4 Part 10): a encoding format that compresses video much more effectively than older (MPEG4) standards.

G. ips: Images per second.

H. MPEG: Moving picture experts group.

I. MPEG4: a video encoding and compression standard that uses inter-frame encoding to significantly reduce the size of the video stream being transmitted.

J. NTSC: National Television System Committee.

K. UPS: Uninterruptible power supply.

L. PTZ: refers to a movable camera that has the ability to pan left and right, tilt up and down, and zoom or magnify a scene.

1.4 QUALITY ASSURANCE

A. The Contractor shall be responsible for providing, installing, and the operation of the VASS System as shown. The Contractor shall also provide certification as required.

B. The security system shall be installed and tested to ensure all components are fully compatible as a system and can be integrated with all associated security subsystems, whether the security system is stand-alone or a part of a complete Information Technology (IT) computer network.

C. The Contractor or security sub-contractor shall be a licensed security Contractor as required within the state or jurisdiction of where the installation work is being conducted.

D. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.

E. Product Qualification:

1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.

2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.

F. Contractor Qualification:

1. The Contractor or security sub-contractor shall be a licensed security Contractor with a minimum of five (5) years experience installing and servicing systems of similar scope and complexity.

The Contractor shall be an authorized regional representative of the Video Assessment and Surveillance System's (VASS) manufacturer. The Contractor shall provide four (4) current references from clients with systems of similar scope and complexity which became operational in the past three (3) years. At least three (3) of the references shall be utilizing the same system components, in a similar configuration as the proposed system. The references must include a current point of contact, company or agency name, address, telephone number, complete system description, date of completion, and approximate cost of the project. The owner reserves the option to visit the reference sites, with the site owner's permission and representative, to verify the quality of installation and the references' level of satisfaction with the system. The Contractor shall provide copies of system manufacturer certification for all technicians. The Contractor shall only utilize factory-trained technicians to install, program, and service the VASS. The Contractor shall only utilize factory-trained technicians to install, terminate and service cameras, control, and recording equipment. The technicians shall have a minimum of five (5) continuous years of technical experience in electronic security systems. The Contractor shall have a local service facility. The facility shall be located within 60 miles of the project site. The local facility shall include sufficient spare parts inventory to support the service requirements associated with this contract. The facility shall also include appropriate diagnostic equipment to perform diagnostic procedures. The COTR reserves the option of surveying the company's facility to verify the service inventory and presence of a local service organization.

2. The Contractor shall provide proof project superintendent with BICSI Certified Commercial Installer Level 1, Level 2, or Technician to provide oversight of the project.

3. Cable installer must have on staff a Registered Communication Distribution Designer (RCDD) certified by Building Industry Consulting Service International. The staff member shall provide consistent oversight of the project cabling throughout design, layout, installation, termination and testing.

> SPEC WRITER NOTE: In the following paragraph use 4 hours for metropolitan

areas and 8 hours for rural areas, adjust
hours as appropriate for project.

G. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within // four // eight // hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.5 SUBMITTALS

SPEC WRITER NOTE: Delete and/or amend all paragraphs and sub-paragraphs and information as needed to ensure that only the documentation required is requested per the Request for Proposal (RFP).

A. Submit below items in conjunction with Master Specification Sections 01 33 23, Shop Drawings, Product Data, and Samples, and Section 02 41 00, Demolition Drawings.

B. Provide certificates of compliance with Section 1.4, Quality Assurance.

C. Provide a pre-installation and as-built design package in both electronic format and on paper, minimum size 1220 x 1220 millimeters (48 x 48 inches); drawing submittals shall be per the established project schedule.

D. Pre-installation design and as-built packages shall include, but not be limited to:

1. Index Sheet that shall:
   a. Define each page of the design package to include facility name, building name, floor, and sheet number.
   b. Provide a list of all security abbreviations and symbols.
   c. Reference all general notes that are utilized within the design package.
   d. Specification and scope of work pages for all security systems that are applicable to the design package that will:
      1) Outline all general and job specific work required within the design package.
      2) Provide a device identification table outlining device Identification (ID) and use for all security systems equipment utilized in the design package.

2. Floor plans, site plans, and enlarged plans shall:
   a. Include a title block as defined above.

    b. Define the drawings scale in both standard and metric measurements.

    c. Provide device identification and location.

    d. Address all signal and power conduit runs and sizes that are associated with the design of the electronic security system and other security elements (e.g., barriers, etc.).

    e. Identify all pull box and conduit locations, sizes, and fill capacities.

    f. Address all general and drawing specific notes for a particular drawing sheet.

3. A riser drawing for each applicable security subsystem shall:

    a. Indicate the sequence of operation.

    b. Relationship of integrated components on one diagram.

    c. Include the number, size, identification, and maximum lengths of interconnecting wires.

    d. Wire/cable types shall be defined by a wire and cable schedule. The schedule shall utilize a lettering system that will correspond to the wire/cable it represents (example: A = 18 AWG/1 Pair Twisted, Unshielded). This schedule shall also provide the manufacturer's name and part number for the wire/cable being installed.

4. A system drawing for each applicable security system shall:

    a. Identify how all equipment within the system, from main panel to device, shall be laid out and connected.

    b. Provide full detail of all system components wiring from point-to-point.

    c. Identify wire types utilized for connection, interconnection with associate security subsystems.

    d. Show device locations that correspond to the floor plans.

    e. All general and drawing specific notes shall be included with the system drawings.

5. A schedule for all of the applicable security subsystems shall be included. All schedules shall provide the following information:

    a. Device ID.

    b. Device Location (e.g. site, building, floor, room number, location, and description).

    c. Mounting type (e.g. flush, wall, surface, etc.).

    d. Power supply or circuit breaker and power panel number.

      e. In addition, for the VASS Systems, provide the camera ID, camera type (e.g. fixed or pan/tilt/zoom (P/T/Z), lens type (e.g. for fixed cameras only) and housing model number.

   6. Detail and elevation drawings for all devices that define how they were installed and mounted.

E. Pre-installation design packages shall be reviewed by the Contractor along with a VA representative to ensure all work has been clearly defined and completed. All reviews shall be conducted in accordance with the project schedule. There shall be four (4) stages to the review process:

  1. 35 percent

  2. 65 percent

  3. 90 percent

  4. 100 percent

F. Provide manufacturer security system product cut-sheets. Submit for approval at least 30 days prior to commencement of formal testing, a Security System Operational Test Plan. Include procedures for operational testing of each component and security subsystem, to include performance of an integrated system test.

G. Submit manufacture's certification of Underwriters Laboratories, Inc. (UL) listing as specified. Provide all maintenance and operating manuals per the VA General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

H. Submit completed System Readiness Checklists provided by the Commissioning Agent and completed by the contractor, signed by a qualified technician and dated on the date of completion, in accordance with the requirements of Section 28 08 00 COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS.

1.6 APPLICABLE PUBLICATIONS

A. The publications listed below (including amendments, addenda, revisions, supplement, and errata) form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American National Standards Institute (ANSI)/Electronic Industries Alliance (EIA):

   330-09 .... Electrical Performance Standards for CCTV Cameras

375A-76 .... Electrical Performance Standards for CCTV
                                Monitors

C. Institute of Electrical and Electronics Engineers (IEEE):

C62.41-02 .... IEEE Recommended Practice on Surge Voltages in
                                Low-Voltage AC Power Circuits

802.3af-08 .... Power over Ethernet Standard

D. Federal Communications Commision (FCC):

(47 CFR 15) Part 15 Limitations on the Use of Wireless Equipment/Systems

E. National Electrical Contractors Association (NECA):

303-2005 .... Installing Closed Circuit Television (CCTV)
                                Systems

F. National Fire Protection Association (NFPA):

70-08 .... Article 780-National Electrical Code

G. Federal Information Processing Standard (FIPS):

140-2-02 .... Security Requirements for Cryptographic Modules

H. Underwriters Laboratories, Inc. (UL):

983-06 .... Standard for Surveillance Camera Units

3044-01 .... Standard for Surveillance Closed Circuit
                                Television Equipment

1.7 COORDINATION

A. Coordinate arrangement, mounting, and support of video surveillance
   equipment:
   1. To allow maximum possible headroom unless specific mounting heights
      that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum
      interference to other installations.
   3. To allow right of way for piping and conduit installed at required
      slope.
   4. So connecting raceways, cables, wireways, cable trays, and busways
      will be clear of obstructions and of the working and access space of
      other equipment.

B. Coordinate installation of required supporting devices and set sleeves
   in cast-in-place concrete, masonry walls, and other structural
   components as they are constructed.

C. Coordinate location of access panels and doors for video surveillance
   items that are behind finished surfaces or otherwise concealed.

1.8 WARRANTY OF CONSTRUCTION

A. Warrant VASS System work subject to the Article "Warranty of Construction" of FAR clause 52.246-21.

B. Demonstration and training shall be performed prior to system acceptance.

PART 2 – PRODUCTS

> SPEC WRITER NOTE: Delete or amend all paragraphs and sub-paragraphs as needed to ensure that only the equipment required per the Request for Proposal (RFP) is provided.

2.1 GENERAL

> SPEC WRITER NOTE: Erase paragraph below if analog/hybrid cameras are not used in the project.

A. Video signal format shall comply with the NTSC standard composite video, interlaced. 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 entry connection to components.

C. Power Connections: Comply with requirements in Section 28 05 00 COMMON WORK REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY, Part 2, as recommended by manufacturer for type of line being protected.

D. 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 CAMERAS

A. All Cameras will be EIA 330 and UL 1.Minimum Protection for Power Connections 120 V and more: Auxiliary panel suppressors shall comply with requirements in Section 28 05 00 COMMON WORK REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY, Part 2.

B. Minimum Protection for Communication, Signal, Control, and Low-Voltage 983 compliant as well as:

1. Will be charge coupled device (CCD cameras and shall conform to National Television System Committee (NTSC) formatting.

2. Fixed cameras shall be color and the primary choice for monitoring following the activities described below. Pan/Tilt/Zoom (P/T/Z) cameras shall be color and are to be utilized to complement the fixed cameras.

> SPEC WRITER NOTE: Leave one of two following paragraphs.

3. Shall be powered by either 12 volts direct current (VDC) or 24 volts alternate current (VAC). Power supplies shall be Class 2 and UL compliant and have a back-up power source to ensure cameras are still operational in the event of loss of primary power to the VASS System.

> SPEC WRITER NOTE: Leave next subparagraph if IP PoE cameras are part of the VASS.

4. Shall be powered over Ethernet. Network switches supporting PoE cameras shall have a back-up power source to ensure cameras are still operational in the event of loss of primary power to the VASS System.

5. Shall be rated for continuous operation under the environmental conditions listed in Part 1, Project Conditions.

> SPEC WRITER NOTE: Erase paragraph 2.2 A 6 if only IP cameras are specified.

6. Will be home run to a monitoring and recording device via a controlling device such as a matrix switcher or network server and monitored on a 24 hour basis at a designated Security Management System location.

7. Each function and activity shall be addressed within the system by a unique user defined name, with minimum of twenty (20) characters. The use of codes or mnemonics identifying the VASS action shall not be accepted.

> SPEC WRITER NOTE: Revise 2.1 A 8) if video motion detection function is the feature of Video Management System (VMS). The Video Motion Detection (VMD) is required either on camera or head-end side (DVR, HDVR, NVR or VMS). Specify the Video Motion Detection requirements as appropriate for the application.

8. Shall come with built-in video motion detection that shall automatically monitor and process information from each camera. The camera motion detection shall detect motion within the camera's

field of view and provide automatic visual, remote alarms as a result of detected motion.

9. Shall be programmed to digitally flip from color to black and white at dusk and vice versa at low light conditions.

10. Will be fitted with AI/DC lenses to ensure the image quality under different light conditions.

11. P/T/Z cameras shall be utilized in a manner that they complement fixed cameras and shall not be used as a primary means of monitoring activity.

12. Dummy or fake cameras will not be utilized at any time.

13. Appropriate signage shall be designed, provided, and posted that notifies people that an area is under camera surveillance.

2.3 VIDEO MANAGEMENT SYSTEM (ANALOG)

A. The Video Management System (VMS)shall provide features and functions as specified below:

1. Supports minimum of [20] <insert number> client connections.

2. The Video Management System shall be capable of recording more than [32] <insert number> days on [1.6] <insert number> TB of internal hard drive storage using the following parameters:

   a. Resolution – 4CIF

   b. Video Mode – NTSC

   c. Quality – Normal

   d. Sensitivity – Normal

   e. Number of Cameras – 16

   f. Record Audio – On

   g. Motion [50%] <insert number representing percentage of the time with motion during the day divided by 24 hours>.

3. The Digital Video Management System shall, at a minimum, combine multiplexing, alarm detection, video motion detection, video, audio, and text recording.

B. System Chassis

1. The Video Management System must utilize a chassis no larger than [three] <insert number> rack units in height, and be suitable for either desktop or rack mount installations. The unit must fit within a standard video rack as well as a server rack.

2. The Video Management System's chassis shall include three indicator lights easily viewed from the front panel. These indicator lights must be colored red, yellow, and green to signify system status.

3. The Video Management System's chassis shall incorporate a minimum of four front accessible, swappable drive bays. The bays must be behind a locking front cover that restricts access not only to the drives, but also to the power switch and reset switch.

C. Operating System

1. The Video Management System's operating system and application must be installed on a separate solid-state system drive (flash memory card), with no moving parts to wear out or fail, to reduce the risk of system failure. Units with the operating system and/or application installed on a hard drive are not acceptable.

D. Recording

1. The Digital Video Management System shall use record mode settings as continuous or event activated.

2. The Digital Video Management System shall provide for simultaneous recording, playback, transmitting, database searching and archiving.

SPEC WRITER NOTE: Delete between // if not required for the project.

3. //One channel of audio and up to sixteen text inputs shall be supported with required hardware properly installed and set up according to manufacturer's instructions. Live audio shall be available for listening while viewing live video. Up to 15 cameras shall be configurable as visible or covert by the authorized user.//

4. The unit must simultaneously record, play back and archive video, text //and audio// while using sophisticated search functions to define and find only those important events that meet certain criteria. The system must also have the ability to host multiple remote users, archive data, and search for data, all while recording multiple video and text streams.

5. The Video Management System shall offer recording rates of up to 480 ips at 1CIF, 480 ips at 2CIF, and 480 ips at 4CIF. The unit shall be able to mix record speeds and quality settings on a "per camera" basis.

6. The Video Management System shall have the ability to capture critical information with higher frame rates for certain cameras, and assign the remainder of the available images per second (ips) to non-critical cameras.

7. The Video Management System shall be available with up to [4] insert number TB of internal hard drive storage. A RAID 5 version shall be available with up to [3] <insert number> TB of internal hard drive storage.

8. The Video Management System's recording format must give each image a unique identification "stamp" to ensure even though the file structure is PC compatible, the original video images cannot be altered or modified, enabling a solid chain of evidence.

9. The Video Management System shall be able to store recorded video on the RAID Storage System (RSS) via an iSCSI interface.

10. The Video Management System shall be able to manage storage of video, audio and text by exporting to Network Attached Storage (NAS), Storage Area Network (SAN) and Direct Attached Storage (DAS) devices using optional software.

11. //The system shall provide option to set up the Video Management System in advanced security mode to enable both IT and security managers to collectively integrate the unit into existing IT network without compromising the security protocols in place. //

E. Network Access

1. The Video Management System shall provide network access through two internal network connections that support [1/10] <insert number> GB network operation.

F. User Interface

1. The Video Management System's user interface must be easy to use, allowing the user to access all operations using one-click buttons, pull-down menus, adjustable sliders, and tabbed screens.

2. The Video Management System shall include the ability to accept text through a network connection, as well as through a serial input with an RS-232 connection. The unit shall be able to mix serial inputs and TCP/IP inputs in any combination up to 16 channels of text.

3. The system shall provide ability for user to specify text criteria, such as a specific ASCII text stream, to schedule recording and search for video, allowing for recording only the video associated with the specified text.

G. Live Video Display

1. The Digital Video Management System's live video display must provide real-time motion in any screen format (full, 2x2, 3x3, and

4x4). The operator shall have the ability to expand any view to full screen with a single click of the mouse.

H. Self-Monitoring Analysis

1. The Digital Video Management System must incorporate Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T.), incorporating a suite of advanced diagnostics that monitor the internal operation of a drive and provide early warning for many types of potential problems. This shall allow for the drive to be repaired or replaced before any data is lost or damaged.

I. External Storage

1. Using the integrated CD/DVD writer (CD-RW or DVD-RW), the Digital Video Management System shall allow users to save video, audio, and text to a standard recordable CD or DVD. The option to include the player software on the CD or DVD shall be available so that no additional software needs to be purchased. The unit must include the ability to export the latest video, audio, and text to a CD or DVD until the CD or DVD is full.

J. Alarm Recording Settings:

1. The Digital Video Management System shall allow for the following Alarm Recording settings:
   a. Image Rate
   b. Quality
   c. Sensitivity

K. Adjustable Alarm Duration

1. The Digital Video Management System shall incorporate an adjustable alarm duration with the pre-alarm and minimum alarm duration programmable from five seconds to five minutes. The units must also allow programmable recording times (alarm schedules) for each day of the week, in thirty minute increments.

L. Supported Dome Camera handlers

1. The Digital Video Management System shall work with the following dome camera handlers: AD168, MP48, AD1024 matrix, VM96RTT, RS422 Dome Control, VM16/ADTT16, VM16E/ADTT16E, Pelco Matrix Switch (models 6700, 6800, 8500, 9500, 9750 or 9760 Pelco P, Pelco D, Bosh, Autodome, BBV Starcard and USB-CCTV.

M. Alarm-Triggered Dome Events

1. The Digital Video Management System must include alarm-triggered dome events, allowing the operator to configure domes to respond to

alarm conditions via Network Client™ or Intellex GUI (using supported dome control handlers). The event can be a motion filter (motion detection, perimeter protection, light change and motion exception), a wired alarm, video loss, or a manually generated alarm. The unit must have the ability to move a single dome, or multiple domes, to preset positions or patterns. This feature must be supported by the dome.

N. Email Support

1. The Digital Video Management System must include the ability to send an email via an email server to anyone, or any group, based upon an event. The events must include, but not necessarily limited to, the following:

   a. System Event

   b. Video Loss

   c. Generated Alarm

   d. Any Filter Alarm

   e. Any Input Alarm

   f. Individual Camera Alarm

O. API Support

1. The Digital Video Management System shall easily integrate with third party software application using an Application Programmers Interface (API). The manufacturer of the unit shall offer a Software Developers Kit (SDK) to select third party manufactures, in addition to sample modular programs with their source codes in both Visual Basic and Visual C++, allowing programmers to develop their own software to control the unit's functions.

2. The Digital Video Management System's API must be backwards compatible with previous versions of the software equal to or greater than v3.2

P. Recorded Event Search

1. In order to instantly retrieve recorded video of any event, the Digital Video Management System shall use a patented search feature to filter through hours of video to find only the essential events. The operator must have the ability to isolate video containing motion, and find video where perimeters were crossed, lights were turned on or off, alarms were triggered, and numerous additional scenarios.

2. In addition to the standard motion based mode, using advanced video analysis tools, the Digital Video Management System shall enable the user to schedule recording and search for video if the movement of an object meets specified size, speed, direction and Motion Exception criteria.

Q. Covert Camera Operation:

1. The Digital Video Management System shall include the ability to configure up to 15 cameras for "covert" operation, restricting their use to only those who are authorized.

R. Activity Log:

1. To provide for more effective security management, the Digital Video Management System must also allow for audits of the activity log to monitor changes to the settings and configurations. The activity log shall include, but not necessarily be limited to, the following information:

   a. User Name – Login name of the user

   b. Date/Time – Date and Time the action was performed

   c. Access Loc – Whether the action was local to the unit or done through remote software

   d. Category – The actions category

   e. Activity – The action performed within the category

   f. Data – Description of the action

2. The operator shall have the ability to export the entire log file, export the displayed log file, print the log file, or print the displayed log file locally and remotely through Network Client v4.3 software.

S. Antivirus Protection

1. The Digital Video Management System shall be compatible with the leading brands of anti-virus software in order to detect and deactivate malicious software that may attempt to attack the system.

T. Remote Configuration and Management software:

1. The Digital Video Management System must include support for Remote Configuration and Management software to allow a user to remotely configure the unit, view live video, or select video segments by time, date, alarm, or search results. The operator must have the ability to save, annotate, and organize copied video into "incident folders" to aid with investigations.

2. The remote management software must allow for up to 64 live video sessions, allowing the operator to view up to sixty four different cameras, from up to 64 different remote sites, simultaneously.

3. The remote management software shall also allow the exporting of video clips to an .avi file to play on any Microsoft Windows based PC. The software shall have the ability to enhance, print, or convert the individual images to standard formats.

4. The remote management software shall allow an operator to select units, cameras, and timeframes for automatic retrieval of video clips to an operators PC. This allows for downloads to be scheduled during times that network traffic restrictions are not an issue.

U. Playback and Multi-screen Playback

1. The Digital Video Management System shall incorporate playback and multi-screen playback functionality to allow the user to locate and select a single stored image to be enhanced using tools. The tools shall include, but not necessarily be limited to, the following:

a. Brightness

b. Contrast

c. Hue

d. Saturation

e. Lightness

f. Balance Light

g. Edge Detect

h. Enhance Light

i. Noise Reduction

j. Sharpen

k. Sharpen More

l. Smooth

m. Smooth More

n. Brightness Chart

V. Browser Client

1. A browser-based viewer (Browser Client) must also be available free of charge, enabling users to host and customize their own website to provide live viewing of the Digital Video Management System through a standard browser interface. Multiple viewers shall have the ability to access video and control domes remotely.

W. Minimum Performance Specifications

Power Supply	100-240 VAC, 50/60 Hz, 3.0/1.5A

Physical Characteristics:	Rack Mount Chassis Version
	Unit Dimensions (HxWxD) 130 mm (5.125") High , 429 mm (16.895") Wide, 546 mm (21.5") Deep
	Rack Height Three (3) units
	Desktop Chassis Version(HxWxD) 130 mm (5.125") High429 mm (16.895") Wide546 mm (21.5") Deep
Environmental Requirements	Operating Temperature 5° to 35° C (41° to 95° F)
	Humidity 5%-95% RH non-condensing
Regulatory	Immunity EN50130-4 (1996) (An Uninterruptable Power Supply must be used to fully comply with EN50130-4)

X. MATRIX SWITCHER

1. The matrix switcher shall meet the following minimum requirements:

    a. Take multiple camera inputs and route them to multiple monitoring stations.

    b. Allow for centralized user management controlling configurations.

    c. Provide live viewing of all cameras.

    d. Provide P/T/Z, focus, and iris control of all unitized cameras.

    e. Be expandable to allow for the addition of multiple cameras and monitoring stations over the life of the system visual identification system by utilizing input and output video and controller cards.

    f. Input cards shall allow for the addition of a minimum of four (4) camera inputs per card.

    g. Output cards shall allow for the addition of a minimum of eight (8) outputs per card.

    h. Have the ability to be programmed either locally or remotely.

    i. Remotely operate multiple cameras from multiple stations.

    j. Be able to fully interface with a digital video recorder (DVR) for recording of all events.

    k. Utilize RS-232 or fiber optic connections for integration with the SMS computer station via a remote port on a network hub.

l. Shall have an alarm interface that is compatible with all associated security subsystems. Alarm inputs shall be via either a relay or an EIA ANSI/EIA/TIA-232-F interface. The interface shall allow for a minimum of 24 alarm inputs and 12 alarm outputs.

m. The switcher response time to an alarm input shall not be less than 200 milliseconds from the time an alarm is sensed until a picture is displayed on a monitor.

n. The switcher shall have a built in buffer to allow for back-log of alarms. These alarms shall be viewable by an operator.

o. Be addressable in the event multiple matrix switchers are connected to the SMS.

p. Be configured, i.e. camera names, monitor names, sequences, alarms and alarm actions, etc. utilizing the configuration program and tools provided by the matrix manufacturer.

2. The matrix switcher shall meet the following minimum input/output requirements:

Camera inputs	16
Video outputs	4
Keyboard/Controller Outputs	4
Alarm inputs	323

3. The matrix switcher will have the following components and technical characteristics:

a. Main Unit:

Functions	Monitor control Camera selection, tour sequence, group sequence, group preset, OSD display, Camera/Receiver control via coaxial or RS-485 cable communication, Recorder control
Alarm control	Alarm event, Alarm Acknowledge, Alarm reset, Alarm suspension, Alarm History Display, Timer event, and Camera event
RS-485 (Camera)Port	6-conductor modular jack x 12 (2- wire or 4-wire communication, With termination switches (MODE 1 to 4))
Extension Port	6-conductor modular jack x 2(With a (EXTENSION 1 IN, OUT) termination switch (TERM: ON, OFF))
Extension Port	37-pin D-sub connector x 2(EXTENSION IN 2 or 3)
Extension Port	37-pin D-sub connector x 2(EXTENSION OUT 2 or 3)

b. Input Board:

Camera Input	1 V [P-P]/75 Ohm (BNC), composite video signal 0.5 V [P- P]/75 Ohm data signal and 2.5 V [P-P]/75 Ohm (25 pin D sub connector x 4)
Alarm Input	N.O. (Normally Open contact) or N.C. (Normally Close contact) selectable x 32 (37 pin D sub connector)

c. Output Board:

Monitor Output	1 V [P-P]/75 Ohm (BNC)
Alarm Output	Open collector output x 32, Max. 24 VDC, 100 mA
Extension Port	6-conductor modular jack x 2
Serial Port	9-pin D-sub connector x 2

Y. IP Network Encoder

   1. The units shall be used for video monitoring and surveillance over IP networks. IP Network Encoder shall encode analog video to MPEG-4 digital video.

   2. The encoder shall use MPEG-4 compression for distribution of images over a network.

   3. The encoder shall be [rack][surface] <erase one> mounted unit.

   4. The encoder shall include, but not be limited to the following:

     a. The encoder shall use "hybrid" technology in providing both analog and network connections with the purpose of allowing users to integrate existing equipment and digital IP products.

       1) The encoder shall provide [one] <insert number of video inputs> composite video input(s).

       2) The encoder shall provide one Ethernet connection.

     b. The encoder shall have the following digital resolution:

       a) D1: 720x576 (NTSC); 720x480 (PAL)

       b) CIF: 352 x 288 (NTSC); 352 x 240 (PAL)

       c) QCIF: 160 x 144 (NTSC); 160 x 112 (PAL)

     c. The encoder shall have a digital frame rate of up to 30 frames per second (NTSC) at 720x480 resolution or 25 fps (PAL) at 720x586 resolution.

     d. The encoder/decoder shall use the following protocols:

       1) TCP/IP

       2) UDP/IP

  3) DHCP

  4) Multicast

  5) Data Throttle

  6) Heart beat

 e. The encoder shall have the following connectors:

  1) Power connector: 3-pin male – for connecting the external power supply

  2) I/O connector: 16-pin male – for connecting alarm, audio, RS-232, RS-485 input and output

  3) Video I/O connector: SVHS style – for input and output connection of two composite monitors

  4) Ethernet port: RJ-45 – for connecting to a network

 f. The encoder/decoder shall have the following indicators:

  1) Power LED

  2) Link – indicates activity on the Ethernet port

  3) Tx activity

  4) Rx activity

 g. The encoder shall have the following additional specifications:

  1) Video

   a) Video signal input: 1 V p-p ±10% 75 ohms, autosensing

   b) Input termination: 75 ohm

   c) Video compression standard: MPEG-4

   d) Audio compression standard: MPEG-1 Layer 2

  2) Audio

   a) Audio input: 315 mV, 40 kOhms, unbalanced

   b) Audio output: 315 mV, 600 ohms, unbalanced

  3) Electrical

   a) External power supply: 100 to 240 VAC

   b) Output voltage: 13.5 V, 1.33 A

   c) Power consumption: 0.5 W maximum

2.3 DIGITAL BASED VIDEO MANAGEMENT SYSTEM

     SPEC WRITER NOTE: Leave paragraph for digital device based video management system.

 A. Key Features

  1. Open Platform: Open API/SDK, supports seamless integration with third party applications.

2. Multi-server and multi-site video surveillance solution: Unlimited recording of video from IP cameras, IP video encoders and selected DVRs with analog cameras.

3. Optimized Recording Storage Management: Unique data storage and archiving solution that combines superior performance and scalability and cost efficient long-term video storage

4. Wide IP camera and device support: Supports connection of more than 839 IP cameras, IP video encoders and selected DVR models from over 79 different vendors through dedicated device integration

5. ONVIF™ and PSIA compliant: Supports ONVIF™ and PSIA compliant cameras and devices

6. Wide compression technology support: Supports the news compression methods; MPEG4 ASP, MxPEG and H.264, besides MJEPG and MPEG4

7. System configuration wizards: Guides the user through the process of adding cameras, configuring video and recording, adjustment of motion detection and user configuration

8. Sequence Explorer: Displaying sequences and time intervals in thumbnail pre-views, the Sequence Explorer gives unparalleled visual overview of recorded video combined with smooth navigation

9. Overlay buttons: Intuitive control of cameras, camera-integrated devices and other integrated systems- directly from the camera view

10. Independent Playback: Instant and independent playback function allows you to independently playback recorded video for one or more cameras, while in live viewing or playback mode

11. Built-in Video Motion Detection: Independent of camera model and supporting up to 64 cameras simultaneously per server

12. Multiple language support: Let operators use the system in their native language with support for 20 different languages

13. Multi-channel, two-way audio: Communicate with people at gates/entrances or broadcast messages to many people at once with multichannel, two-way audio

14. Fast evidence export: Quickly deliver authentic evidence to public authorities by exporting video to various formats, including video from multiple cameras with viewer, logs, and user notes included

B. Administration Features

1. Single Management Application: A new Management Application provides a consolidated single point management access to Recording Servers.

2. System configuration wizards: Guides the user through the process of adding cameras, configuring video and recording, adjustment of motion detection and user configuration.

3. Automated device discovery: Enables fast discovery of camera devices using methods such as Universal Plug And Play, Broadcast and IP Range scanning.

4. Smart bulk configuration option: Change settings across multiple devices simultaneously and in a very few clicks.

5. Adaptable application behavior: Guides novice users, while expert users can optimize the application for efficient use.

6. Export/import of system and user configuration data: System backup for reliable system operation and fast system recovery. System cloning for efficient rollout of multiple systems with the same, or similar, configuration.

7. Import of off-line configuration data: Enabling off-line editing of configuration data, including camera and device definitions.

8. Automatic system restore points: A 'Restore Point' is created each time a configuration change is confirmed.

9. Enables easy rollback to previously defined system configuration points and enables cancelation of undesired configuration changes and restoration of earlier valid configurations.

C. Integration Options

1. Open Software Development Kit (SDK) makes it possible to video enable your business processes, through seamless integration of third party applications, such as video analytics, access systems, etc.

2. Compatible with Central for alarm overviews and operational status in larger video surveillance installations.

3. Integrate with physical access control systems, alarms, gates, building management systems, etc. using hardware I/O, internal events and TCP/IP events

4. Create, import and use HTML pages for navigation between views or to trigger a Smart Wall preset

5. Develop third party plug-ins for the Smart Client to expand with new functionality

D. Server Modules

1. Recording Server

    a. Simultaneous digital multi-channel video and audio recording and live viewing (relaying).

    b. Two-way audio enables integrated control of microphones and speakers connected to IP devices.

    c. Bandwidth optimized multi-streaming by splitting a single camera video stream to differentiated streams for live view and recording, where each can be optimized independently with respect to frame rate and resolution.

    d. Connectivity to cameras, video encoders and selected DVRs supports MJPEG, MPEG4, MPEG4 ASP*, H.264* and MxPEG.

    e. Auto-detect camera models during setup.

2. Flexible multi-site, multi-server license structure charged per camera.

3. Unlimited number of installed cameras; simultaneous recording and live view of up to 64 cameras per server.

4. Recording technology: secure high speed database holding JPEG images or MPEG4 and MxPEG streams including audio.

5. Recording speed: 30+ frames per second per camera, limited only by hardware.

6. Recording quality depends entirely on camera and video encoder capabilities: no software limitation.

7. Start cameras on live view requests from clients.

8. Unlimited recording capacity with multiple archives possible per day.

9. Hourly to daily database archiving with optional automatic move to network drive saves storage capacity on the local server – with images still available transparently for playback

10. Built-in, real-time, camera independent motion detection (VMD); fully adjustable sensitivity, zone exclusions, recording activation with frame rate speed up, and alert activation through email or SMS.

11. Start recording on event.

12. Client initiated start of recording based on pre-defined recording time and access privileges.

13. Pan Tilt Zoom (PTZ) preset positions, up to 50 per camera.

14. Absolute* and relative PTZ positioning.

15. PTZ go-to preset position on events.

16. Combine PTZ patrolling and go-to positions on events.

17. Set multiple patrolling schedules per camera per day: i.e. different for day/night/weekend.

18. PTZ scanning on supported devices: viewing or recording while moving slowly between PTZ positions.

19. VMD-sensitive PTZ patrolling among selected presets allows sending of Wipe and Wash commands to supported PTZ models.

20. On pre-defined events Matrix remote commands are automatically sent to display live video remotely on computers running the Matrix Monitor or the Smart

21. Client with Matrix Plug-in.

    a. Flexible notification (sound, e-mail and SMS) and camera patrolling scheduling, triggered by time or event.

E. Recording Server Manager

    1. Local console management of the Recording Server accessible from the notification area.

    2. Start and stop Recording Server service.

    3. Access to Recording Server configuration settings.

    4. Access to Recording Server help system.

    5. View system status and log information.

F. Image Server

    1. Remote access for Smart and Remote Clients.

    2. Built-in web server for download and launch of clients and plug-ins.

    3. Set up one Master and multiple Slave Servers.

    4. Authenticate access based on Microsoft Active Directory user account, or user name and password.

    5. Authorize access privileges per Microsoft Active Directory user account/group, user profile or grant full access.

    6. User profiles control access to: Live view, PTZ, PTZ presets, Output control, Events, Listen to microphone, Talk to speaker, Manual recording; Playback, AVI export, JPG export, DB export, Sequences, Smart Search and audio. As well as Set up views, Edit private views and Edit shared public views.

    7. Audit logs of exported evidence by user and file.

    8. Audit logs of client user activity by time, locations and cameras.

G. Recording Viewer

    1. Playback recorded video and audio locally on the

H. Recording Server.

    1. View up to 16 cameras time-synched during playback.

2. Scrollable activity timeline with magnifying feature.

3. Instant search on recordings based on date/time and activity/alarm (Video Motion Detection).

4. 'Smart Search' for highlighted image zones and objects.

5. Evidence can be generated as a printed report, a JPEG image, an AVI film or in the native database format.

6. Export audio recordings in WAV or AVI format.

7. Export video digitally zoomed to view area of interest only and to minimize export footprint size.

8. Export 'Evidence CD' containing native database and Recording Viewer for instant, easy viewing by authorities.

9. Encryption & password protection option for exported recordings and files.

10. Ability to add comments to exported evidence, also encrypted.

11. Option to send email.

12. De-interlacing of video from analog cameras.

13. IPIX technology for PTZ in 360° recorded images.

I. PDA Server

1. Remote access for PDA Client.

2. Handle login and session requests between PDA clients and Image Server.

3. Resize video surveillance images to fit the screen layout of PDA Client.

J. Smart Client Module

1. Smart Client includes all the features of Remote Client plus more:

2. Installed per default on Recording Server for local viewing and playback of video and audio.

3. Start recording on cameras for a pre-defined time (default 5 minutes). Subject to privileges set by administrator.

4. • Independent Playback capability allows for instant playback of recorded video for one or more cameras, while in live and playback mode

5. Live view digital zoom allows zoomed-out recordings while the operator digitally can zoom in to see details.

6. 'Update On Motion Only' optimizes CPU usage by letting motion detection control whether the image should be decoded and displayed or not. The visual effect is a still image in the view until motion is detected.

7. Shared and private camera views offer 1x1 up to 10x10 layouts in addition to asymmetric views.

8. Views optimized for both 4:3 and 16:9 screen ratios.

9. Multiple computer monitor support with a main window and any number of either windowed or full screen views.

10. Hotspot function for working in details with a camera selected from a view containing multiple cameras.

11. Carousel function allows a specified view to rotate between pre-defined cameras with individual timing and order with multiple appearances. Carousel function can be controlled allowing the operator to pause carousel function and to switch to previous or next camera.

12. Overlay buttons provides intuitive control of cameras, camera-integrated devices and other integrated systems- directly from the camera view

13. Matrix function to view live video from multiple cameras through the Image Server in any view layout with customizable rotation path, remotely controlled by Smart

14. Clients or Recording Servers sending Matrix remote commands

15. Send Matrix remote commands to display live video remotely on computers running the Matrix Monitor or the Smart Client with Matrix Plug-in.

16. Cameras' built-in audio sources available in live and in playback.

17. Separate pop-up window displaying sequences and time intervals in thumbnail pre-views, the Sequence Explorer gives unparalleled visual overview of recorded video combined with smooth navigation

18. Presents recorded sequences for individual cameras, or all cameras in a view

19. Seamlessly available in both Live and Playback modes

20. Smooth navigation with sliding preview and "drag-andthrow" function for video thumbnails

21. Instant playback of video sequences

22. Application Options allows users to adapt the layout and personalize the application to their particular preferences

K. Remote Client

1. View live video or playback recordings for 1-16 cameras simultaneously; from the same or different servers.

2. Advanced video navigation including fast/slow playback, jump to date/time, single step and video motion search.

3. Individual views can be user-defined in various layouts: view or playback camera images from multiple servers simultaneously in the same view.

4. Shared views can be managed centrally via the server with admin/user rights and user groups.

5. Import static or active HTML maps for fast navigation to cameras and good premise overviews.

6. Control output port relay operation, for example control of gates.

7. Quick overview of sequences with detected motion and preview window.

8. Quick overview of events/alerts.

9. Control PTZ cameras remotely, also using preset positions.

10. Remote PTZ Point-and-Click control

11. Remote PTZ zoom to a marked rectangle.

12. Take manual control over a PTZ camera that runs a patrolling scheme; after a timeout with no activity the camera reverts to its scheduled patrolling.

13. IPIX 1x2 or 2x2 'Quad View' for viewing all 360° at once.

14. Optional video compression in streaming from server to client gives better use of bandwidth.

15. Create AVI files or save JPEG images.

16. Print incident reports with free-text user comments.

17. System logon using user name and password.

18. System logon using Microsoft Active Directory user accounts.

L. PDA Client

1. View live or playback video from a single server or from multiple servers in half-screen or full-screen formats.

2. In live view you can control Pan/Tilt/Zoom cameras manually or use preset positions, and control the cameras' output relays to trigger external actions like opening doors or gates, turning on lights, etc.

3. To find recordings, you can jump to specific time/date or to next detected motion, or use motion detection sequence overviews.

4. When viewing recordings, you can playback at variable speed or single step image by image.

5. The PDA client shall connect to the VMS server using any IP connection; typically wireless LAN, GPRS, etc.

6. Video compression from the server to PDA optimizes bandwidth usage.

7. System logon using user name and password.

M. Matrix Monitor

1. Virtual Matrix showing live video directly from up to 4 cameras at a time triggered remotely by Matrix remote commands.

2. Camera view shifts by FIFO (first-in-first-out)

3. Multiple events can control a single Matrix monitor and single events can control multiple monitors.

> SPEC WRITER NOTE: Adjust VMS Server specifications per project requirements.

N. Minimum System Requirements VMS Server

1. HW Platform:

a. Minimum 2.4 GHz CPU and 1 GB RAM (2.4 GHz dual core processor and 2 GB RAM or more recommended).

b. Minimum 1 GB disk space available, excluding space needed for recordings.

2. OS:

a. Microsoft® Windows® XP Professional (32 bit or 64 bit*), Windows Server 2003 (32 bit or 64 bit*), Windows Server 2008 R1/R2 (32 bit or 64 bit*), Windows Vista™ Business (32 bit or 64 bit*), Windows Vista Enterprise (32 bit or 64 bit*), Windows Vista Ultimate (32 bit or 64 bit*), Windows 7 Professional (32 bit or 64 bit*), Windows 7 Enterprise (32 bit or 64 bit*) and Windows 7 Ultimate (32 bit or 64 bit*).

3. Software:

a. Microsoft .NET 3.5 Framework SP1, or newer.

b. DirectX 9.0 or newer required to run Playback Viewer application.

> SPEC WRITER NOTE: Adjust PDA Server specifications per project requirements. Remove if not necessary for the project.

O. Minimum System Requirements PDA Server

1. HW Platform:

a. Minimum 2.4 GHz CPU and 1 GB RAM (2.4 GHz dual core processor and 2 GB RAM or more recommended).

b. Minimum 1 GB disk space available.

2. OS:

a. Microsoft Windows XP Professional (32 bit or 64 bit*), Windows Server 2003 (32 bit or 64 bit*).

3. Software:

    a. Microsoft .NET 2.0 (not compatible with newer versions). Internet Information Server (IIS) 5.1.

P. Minimum System Requirements VMS Client

1. HW Platform:

    a. Minimum 2.4 GHz CPU, 1 GB RAM (more powerful CPU and higher RAM recommended for Smart Clients running high number of cameras and multiple views and displays).

2. Graphics Card:

    a. AGP or PCI-Express, minimum 1024 x 768 (1280 x 1024 recommended), 16 bit colors.

3. OS:

    a. Microsoft Windows XP Professional (32 bit or 64 bit*), Windows Server 2003 (32 bit or 64 bit*), Windows Server 2008 R1/R2 (32 bit or 64 bit*), Windows Vista Business (32 bit or 64 bit*), Windows Vista Enterprise (32 bit or 64

    b. bit*), Windows Vista Ultimate (32 bit or 64 bit*), Windows 7 Professional (32 bit or 64 bit*), Windows 7 Enterprise (32 bit or 64 bit*) and Windows 7 Ultimate (32 bit or 64 bit*).

4. Software:

    a. DirectX 9.0 or newer required to run Playback Viewer application.

    b. Microsoft .NET 3.5 Framework SP1, or newer.

Q. Minimum System Requirements VMS Remote Client

1. HW Platform:

    a. Minimum 2.4 GHz CPU, RAM 1 GB (2 GB or higher recommended on Microsoft Windows Vista).

2. OS:

    a. Microsoft Windows XP Professional (32 bit or 64 bit*), Windows Server 2003 (32 bit or 64 bit*), Windows Server 2008 R1/R2 (32 bit or 64 bit*), Windows Vista Business (32 bit or 64 bit*), Windows Vista Enterprise (32 bit or 64 bit*) and Windows Vista Ultimate (32 bit or 64 bit*), Windows 7 Professional (32 bit or 64 bit*), Windows 7 Enterprise (32 bit or 64 bit*) and Windows 7 Ultimate (32 bit or 64 bit*).

3. Software:

a. DirectX 9.0 or newer required to run Playback Viewer Application Microsoft Internet Explorer 6.0, or newer, 32 bit version required

> SPEC WRITER NOTE: Adjust paragraphs to provide licensing information per project requirements.

R. Licensing Structure

1. Base Server License

a. An VMS Base Server license is mandatory for installing the product.

2. The Base Server license contains:

a. Unlimited numbers of Recording Server licenses

b. Unlimited numbers of Smart Clients, Remote Clients, PDA Clients and Matrix Monitor licenses

3. Camera License

a. To connect to a camera, a Device License per camera channel is required

b. In total, for all copies of the product installed under a given Base Server license, the product may only be used with as many cameras as you have purchased camera licenses for • Video encoders and DVRs with multiple analog cameras require a license per channel to operate

c. Camera Licenses can be purchased in any numbers. To extend the installation with additional Camera Licenses, the Base Server License number (SLC) is required when ordering.

4. Client License:

a. All client modules are not licensed and can be installed and used on any number of computers.

S. IP NETWORK DECODER

1. The unit shall be used for video monitoring and surveillance over IP networks. Network decoder shall decode MPEG-4 digital video to analog video.

2. The decoder shall use MPEG-4 compression for efficient distribution of images over a network.

3. The decoder shall be available as a standalone unit that can be horizontally or vertically mounted.

4. The decoder shall include, but not be limited to the following:

a. The decoder shall use "hybrid" technology in providing both analog and network connections with the purpose of allowing users to integrate existing equipment and digital IP products.

   1) The decoder shall provide one composite video input and output connection.

   2) The decoder shall provide one Ethernet connection.

b. The decoder shall have the following digital resolution:

   1) D1: 720x576 (NTSC); 720x480 (PAL)

   2) CIF: 352 x 288 (NTSC); 352 x 240 (PAL)

   3) QCIF: 160 x 144 (NTSC); 160 x 112 (PAL)

c. The decoder shall have a digital frame rate of up to 30 frames per second (NTSC) at 720x480 resolution or 25 fps (PAL) at 720x586 resolution.

d. The decoder shall use the following protocols:

   1) TCP/IP

   2) UDP/IP

   3) DHCP

   4) Multicast

   5) Data Throttle

   6) Heart beat

e. The decoder shall have the following connectors:

   1) Power connector: 3-pin male – for connecting the external power supply

   2) I/O connector: 16-pin male – for connecting alarm, audio, RS-232, RS-485 input and output

   3) Video I/O connector: SVHS style – for input and output connection of two composite monitors

   4) Ethernet port: RJ-45 – for connecting to a network

f. The decoder shall have the following indicators:

   1) Power LED

   2) Link – indicates activity on the Ethernet port

   3) Tx activity

   4) Rx activity

5. The decoder shall have the following additional specifications:

  a. Video

   1) Video signal output: 1 V p-p into 75 ohms

   2) Input termination: 75 ohm

   3) Video compression standard: MPEG-4

        4) Audio compression standard: MPEG-1 Layer 2

    b. Audio

        1) Audio input: 315 mV, 40 kOhms, unbalanced

        2) Audio output: 315 mV, 600 ohms, unbalanced

    c. Electrical

        1) External power supply: 100 to 240 VAC

        2) Output voltage: 13.5 V, 1.33 A

        3) Power consumption: 0.5 W maximum

2.4 VIDEO DISPLAY EQUIPMENT

A. Video Display Equipment

1. Will consist of color monitors and shall be EIA 375A compliant.

2. Shall be able to display analog, digital, and other images in either NTSC or MPEG format associated with the operation of the Security Management System (SMS).

3. Shall:

    a. Have front panel controls that provide for power on/off, horizontal and vertical hold, brightness, and contrast.

    b. Accept multiple inputs, either directly or indirectly.

    c. Have the capabilities to observe and program the VASS System.

    d. Be installed in a manner that they cannot be witnessed by the general public.

B. Color Video Monitors Technical Characteristics:

Sync Format	PAL/NTSC
Display Tube	90° deflection angle
Horizontal Resolution	250 TVL minimum, 300 TVL typical
Video Input	1.0 Vp-p, 75 Ohm
Front Panel Controls	Volume, Contrast, Brightness, Color
Connectors	BNC

C. Liquid Crystal Display (LCD) Flat Panel Display Monitor

> SPEC WRITER NOTE: Adjust values in LCD monitor specification per project requirements.

D. The [17] <insert size> -inch color LCD monitor shall have a flat screen and [17] <insert size> -inch diagonal viewing area and consists of an LCD panel, bezel, and stand.

E. The monitor shall meet or exceed the following specifications:

1. The monitor shall incorporate a [17.1] <insert size> -inch active matrix TFT LCD panel.

   a. The pixel pitch of the monitor's LCD panel shall be 0.264 mm horizontal and 0.264 mm vertical.

   b. The monitor shall have a maximum resolution of <500> <insert resolution> television lines.

   c. The contrast ratio shall be 500:1.

   d. The typical brightness shall be 250 cd/m²

   e. The monitor shall display at least 16.7 million colors.

   f. The light source for the LCD panel shall have a lifetime of [50,000] <insert hours> hours.

   g. The scan frequency horizontal shall be 30 K to 80 KHz and the scan frequency vertical shall be 56 to 75 Hz.

   h. The viewing angle for the monitor shall be 170 degrees horizontal and 170 degrees vertical.

2. The monitor shall have automatic NTSC or PAL recognition.

   SPEC WRITER NOTE: Delete and renumber below if picture-in-picture function is not required.

3. The monitor shall have a picture-in-picture function.

4. The monitor shall use the following signal connectors:

   SPEC WRITER NOTE: Delete/add connectors as required by the project.

   a. Video 1.0 V peak-to-peak at 75 ohms

   b. BNC in/out

   c. Y/C (S-video) in/out

   d. Audio in/out

   e. VGA 15-pin D-Sub

5. The monitor shall have [one/two] <insert number> audio speaker(s).

   a. The speaker shall be 0.5 W minimum.

6. The monitor shall have the following front control panel buttons:

   a. Power on/off

   b. LED indicator

   c. Mode

   d. Increase (volume)

   e. Decrease (volume)

        f. Up (contrast adjustment)

        g. Down (brightness adjustment)

        h. Menu

        i. Auto

    7. The monitor shall have the following options for adjustment in an onscreen display menu:

        a. Color

        b. Tint

            1) NTSC mode only

                a) Brightness

                b) Contrast

                c) Sharpness

                d) Volume

                e) Language

                f) Scan

                g) Color Temp

                h) H-Position

                i) Recall

F. The electrical specifications for the monitor shall be as follows:

    1. Input voltage shall be 12 VDC/3 A.

    2. Power consumption shall be 50 W maximum.

G. The environmental specifications for the monitor shall be as follows:

    1. Operating temperature shall be 32 to 104 degrees Fahrenheit or 0 to 40 degrees Celsius.

    2. Operating humidity shall be 10 to 85 percent.

H. The physical specifications for the monitor shall be as follows:

I. The monitor shall conform to these compliance standards:

    1. FCC

    2. CE (EMC/LVD)3. UL

2.5 CONTROLLING EQUIPMENT

A. Shall be utilized to call up, operate, and program all cameras associated VASS System components.

B. Will have the ability to operate the cameras locally and remotely. A matrix switcher or a network server shall be utilized as the VASS System controller.

C. The controller shall be able to fit into a standard 47.5 cm (19 inch) equipment rack.

D. Control and programming keyboards shall be provided with its own type of switcher. All keyboards shall:

1. Be located at each monitoring station.

2. Be addressable for programming purposes.

3. Provide interface between the operator and the VASS System.

4. Provide full control and programming of the switcher.

5. Have the minimum following controls:

   a. programming

   b. switching

   c. lens function

   d. P/T/Z

   e. environmental housing

   f. annotation

2.6 VIDEO CAMERAS

A. The cameras shall be high-resolution color video cameras with wide dynamic range capturing capability.

B. The camera shall meet or exceed the following specifications:

1. The image capturing device shall be a [1/3]/[1/4]-inch image sensor designed for capturing wide dynamic images.

   a. The image capturing device shall have a separate analog-to-digital converter for every pixel.

   b. The image capturing device shall sample each pixel multiple times per second.

   c. The dynamic range shall be 95 dB typical and 120 dB maximum.

3. The camera shall optimize each pixel independently.

4. The camera shall have onscreen display menus for programming of the camera's settings.

5. The signal system shall be NTSC.

C. The camera shall have composite video output.

D. The camera shall come with a manual varifocal lens.

E. The video output shall be composite: 1.0 volts peak-to-peak at 75-ohm load.

> SPEC WRITER NOTE: Revise subparagraph to include camera mounts required for the project.

H. Fixed Color Camera

1. The camera shall be a high-resolution color video camera with wide dynamic range capturing capability.

2. Comply with UL 639.

3. Pickup Device: [1/3]/[1/4] CCD interline transfer.

4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.

5. With AGC, manually selectable on or off.

6. Manually selectable modes for backlight compensation or normal lighting.

7. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.

8. White Balance: Auto-tracing white balance, with manually selectable fixed balance option.

> SPEC WRITER NOTE: Copy and edit table in following paragraph to accommodate for all fixed analog color camera models in the project.

9. Fixed Color Cameras Technical Characteristics:

Pickup device	1/3" interline transfer CCD
Total pixels	NTSC: 811(H) x 508(V)
Effective pixels	NTSC: 768(H) x 494(V)
Resolution	500 TV lines
Sync. System	Internal Sync
Scanning system	NTSC: 525 Lines/60 Fields
S/N ratio	More than 48 dB
Electronic shutter	Auto 1/60 (1/50) ~1/100,000 sec.
Min. illumination	0.2 lux F2.0
Video output	Composite 1.0 Vp-p/75 ohm
White balance	Auto
Automatic gain control	ON
Frequency horizontal	NTSC: 15.734 KHz
Frequency vertical	NTSC: 59.94Hz
Lens type	Board lens/[DC]/[AI] varifocal lens
Focal length	[3-12mm]<insert values>
Power source	DC12V/500mA or AC24/500mA
Power consumption	< 3W (Max)

> SPEC WRITER NOTE: Leave next subparagraph if dome/mini dome fixed cameras are designed for the project.

10. [Fixed color camera shall be enclosed in dome and have board mounted varifocal lens].

11. Camera accessories shall include:

    a. Surface mount adapter

    b. Wall mount adapter

    c. Flush mount adapter

    d. <list>

2.7 AUTOMATIC COLOR DOME CAMERA - ANALOG

A. The camera shall be a high-resolution color video camera with wide dynamic range capturing capability.

B. Comply with UL 639.

C. Pickup Device: [1/3]/[1/4] CCD interline transfer.

D. Horizontal Resolution: 480 lines.

E. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.

F. With AGC, manually selectable on or off.

G. Sensitivity: Camera shall provide usable images in low-light conditions, delivering an image at a scene illumination of <Insert light level> lux at <Insert f-stop of lens>[, with the camera AGC off].

H. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.

I. Manually selectable modes for backlight compensation or normal lighting.

J. Pan and Tilt: Direct-drive motor, 360-degree rotation angle, and 180-degree tilt angle. Pan-and-tilt speed shall be variable controlled by operator. Movement from preset positions shall be not less than 300 degrees per second.

K. Preset positioning: 64 user-definable scenes. Controls shall include the following:

    1. In "sequence mode," camera shall continuously sequence through preset positions, with dwell time and sequencing under operator control.

    2. Motion detection shall be available at each camera position.

L. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.

M. White Balance: Auto-tracing white balance, with manually settable fixed balance option.

N. Motion Detector: Built-in digital.

O. Dome shall support multiplexed control communications using coaxial cable recommended by manufacturer.

P. Automatic Color Dome Camera Technical Characteristics:

SPEC WRITER NOTE: Copy and edit table in following paragraph to accommodate for all PTZ analog color camera models in the project.

Effective Pixels	768 (H) x 494 (V)
Scanning Area	1/4-type CCD
Synchronization	Internal/Line-lock/Multiplexed Vertical Drive (VD2)
Video Output	1.0 v[p-p] NTSC composite/75 ohm
H. Resolution	570-line at B/W, or 480-line at color imaging
Signal-to-noise Ratio	50dB (AGC off, weight on)
Super Dynamic II	64 times (36dB) (selectable on/off)
Minimum Illumination	0.06 lx (0.006 fc) at B/W, 1 lx(0.1 fc)
Zoom Speed	Approx. 2.1s (TELE/WIDE) in sequence mode
Focus Speed	Approx. 2s (FAR/NEAR) in sequence mode
Iris	Automatic (Open/Close is possible)/manual
Maximum Aperture Ratio	1:1.6 (Wide) ~ 3.0 (Tele)
Focal Length	3.79 ~ 83.4 mm
Angular Field of View	H 2.6° ~ 51.7° V 2.0° ~ 39.9°
Electronic Shutter	1/60 (off), 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, 1/10,000 s
Zoom Ratio	Optical 22x w/10x electronic zoom
Iris Range	F1.6 ~ 64, Close
Panning Range	360° endless
Panning Speed	Manual: Approx. 0.1°/s ~ 120°/s 16 steps
Tilting Range	0 ~ 90° (Digital Flip off), 0 ~180° (Digital Flip on)
Tilting Speed	Manual: Approx. 0.1°/s ~ 120°/s. 16 steps

Pan/Tilt	Manual/Sequential position/Auto Pan
Controls	Pan/Tilt, Lens, 64 Preset Positions, Home Position
Video Connector	BNC
Controller I/F	Multiplex-coaxial

Q. Camera accessories shall include:

1. Surface mount adapter

2. Wall mount adapter

3. Flush mount adapter

4. <list>

R. Indoor/Outdoor Fixed Mini Dome System (IP)

1. The indoor/outdoor fixed mini dome system shall include a built-in 100Base-TX network interface for live streaming to a standard Web browser.

2. The network mini dome shall be integrated into the back box design to accept multiple camera options without modification. The network mini dome shall operate in open architecture connectivity for third-party software recording solutions.

3. The indoor/outdoor fixed mini dome system shall meet or exceed the following design and performance specifications.

Imaging Device	1/3-inch imager
Picture Elements	NTSC/PAL 720 (H) x 540 (V) 720 (H) x 540 (V)
Dynamic Range	102 dB typical/120 dB maximum (DW/CW models only)
Scanning System	2:1 interlace (progressive option on CW/DW models only
Synchronization	Internal
Electronic Shutter Range	Auto (1/15-1/22,000)
Lens Type	Varifocal with auto iris
Format Size	1/3-inch
Focal Length	3.0 mm-9.5 mm 9.0 mm-22.0 mm <list>
Operation	Iris Auto (DC-drive) Focus Manual Zoom Manual
Minimum Illumination	Color (day): 0.8 lux, SENS 8X: 0.2 lux, B-W (night): 0.08 lux, SENS

	8X: 0.02 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance)
	Color (day): 0.15 lux, B-W (night): 0.015 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance)
	Color (day): 0.8 lux, SENS 8X: 0.2 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance) 0.2 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance)
Compression	MPEG-4, MJPEG in Web viewing mode
Video Streams	3, simultaneous
Video Resolutions	NTSC PAL 4CIF 704 x 480 704 x 576 2CIF 704 x 240 704 x 288 CIF 352 x 240 352 x 288 QCIF 176 x 120 176 x 144
Bit Rate	Configurable, 20 kbps to 2 Mpbs per stream
Web User Interface	
Environment	Low temperature, indoor/outdoor
Connectors	RJ-45 for 100BASE-TX, Auto MDI/MDI-X
Cabling	CAT5 cable or better for 100BASE-TX
Input Voltage	24 VAC (18-36) or PoE input voltage
Power Consumption	<7.5 Watts,<13 Watts with heaters 24VAC: <0.5 Amps, <0.9 Amps with heaters
Alarm Input	10 VDC maximum, 5 mA maximum
Alarm Output	0 to 15 VDC maximum, 75 mA maximum
Service Connector	Internal to housing for 2.5 mm connector for NTSC/PAL video outputs
Service Connector	3-conductor, 2.5 mm connector for video output to optional (IS-SC cable)
Pan/Tilt Adjustment	Pan 360°, tilt 80° (20° to 100° range), and rotation 360°
Light Attenuation	smoked bubble, f/1.5 light loss; clear bubble, zero light loss
CERTIFICATIONS	CE, Class B UL Listed Meets NEMA Type 4X and IP66 standards

3. Accessories

a. Pendant mount

b. Wall mount for pendant

c. Corner adapter for wall mount

d. Pole adapter for wall mount

e. <list accessories>

S. Megapixel High Definition Integrated Digital Network Camera

1. The network camera shall offer dual video streams with up to 3.1 megapixel resolution (2048 x 1536) in progressive scan format.

2. An alarm input and relay output shall be built in for integration with hard wired external sensors.

3. The network camera shall be capable of firmware upgrades through a network using a software-based device utility.

4. The network camera shall offer auto back focus (ABF) functionality through a push button on the camera. ABF parameters shall also be configurable through a standard Web browser interface.

5. The network camera shall offer a video output port providing an NTSC/PAL analog video output signal for adjusting field of view and focus at the camera.

6. The network camera shall provide advanced low-light capabilities for color and day/night models with sensitivity down to 0.12 lux in color and 0.03 lux in black-white (B-W).

7. The network camera shall have removable IR cut filter mechanism for increased sensitivity in low-light installations. The sensitivity of IR cut filter removal shall be configurable through a Web browser.

8. The network camera shall support two simultaneous, configurable video streams. H.264 and MJPEG compression formats shall be available for primary and secondary streams with selectable unicast and multicast protocols. The streams shall be configurable in a variety of frame rates and bit rates.

9. The network camera shall support industry standard Power over Ethernet (PoE)

10. IEEE 802.3af to supply power to the camera over the network. The network camera shall also offer a 24 VAC power input for optional use.

11. The network camera shall use a standard Web browser interface for remote administration and configuration of camera parameters.

12. The network camera shall have a window blanking feature to conceal user-defined privacy areas that cannot be viewed by an operator. The network camera shall support up to four blanked windows. A blanked area shall appear on the screen as a solid gray window.

13. The network camera shall support standard IT protocols.

14. The network camera shall support open architecture best practices with a published API available to third-party network video recording and management systems.

15. Megapixel High Definition Integrated Digital Network Camera Technical Specifications:

SPEC WRITER NOTE: Edit the table below to include technical specifications as required by the project.

Imaging Device	1/3-inch, effective
Imager Type	CMOS, Progressive scan
Maximum Resolution	2048 x 1536
Signal-to-Noise Ratio	50 dB
Auto Iris Lens Type	DC drive
Electronic Shutter Range	1~1/100,000 sec
Wide Dynamic Range	60 dB
White Balance Range	2,000° to 10,000°K
Sensitivity	f/1.2; 2,850K; SNR >24dB Color (1x/33ms) 0.50 lux Color SENS (15x/500 ms) 0.12 lux Mono SENS (15x/500 ms) Mono (1x/33ms)0.25 lux 0.03 lux
Dome Attenuation	Clear Zero light loss Smoke f/1.0 light loss
Compression	H.264 in base profile and MJPEG
Video Streams	Up to 2 simultaneous streams, the second Stream variable based on the setup of the primary stream
Frame Rate	Up to 30, 25, 24, 15, 12.5, 12, 10, 8, 7.5, 6.5, 4, 3, 2, and 1 (depending upon coding, resolution, and stream configuration
Available Resolutions	3.1 MPx2048 x 1536; 4:3 aspect ratio; 2.0 ips max., 10.0 Mbps bit rate for MJPEG; 3.0 ips max., 2.6 Mbps bit rate H.264

	2.1 MPx1920 x 1080; 16:9 aspect ratio: 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 5.0 ips max., 2.7 Mbps bit rate H.264 3.1.9 MPx1600 x 1200; 4:3 aspect ratio; 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 6.0 ips max., 2.6 Mbps bit rate H.264
	1.3 MPx1280 x 1024; 5:4 aspect ratio; 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 8.0 ips max., 2.5 Mbps bit rate H.264
	1.2 MPx1280 x 960; 4:3 aspect ratio; 15.0 ips max., 9.8 Mbps bit rate for MJPEG; 9.8 ips max., 8.5 Mbps bit rate H.264 6.0.9 MPx1280 x 720; 16:9 aspect ratio; 30.0 ips max.,10.0 Mbps bit rate for MJPEG; 12.5 ips max., 2.5 Mbps bit rate H.264
	0.5 MPx800 x 600; 4:3 aspect ratio; 30.0 ips max., 5.8 Mbps bit rate for MJPEG; 25.0 ips max., 2.0 Mbps bit rate H.264 8.0.3 MPx640 x 480; 4:3 aspect ratio; 30.0 ips max., 3.7 Mbps bit rate for MJPEG; 30.0 ips max.,1.6 Mbps bit rate H.264
	0.1 MPx320 x 240; 4:3 aspect ratio; 30.0 ips max., 0.9 Mbps bit rate for MJPEG; 30.0 ips max., 0.4 Mbps bit rate H.264
	Additional640 x 512, 640 x 352, 480 x 368, 480 x 272, 320 x 256, 320 x 176
Supported Protocols	TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP,IPv4, SNMP, QoS, HTTP, HTTPS, LDAP(client), SSH, SSL, STMP, FTP, MDNS(Bonjour), and 802.1x (EAP)
Security Access	Password protected
Software Interface	Web browser view and setup, up to 16 cameras
Connectors	RJ-45 for 100Base-TX, Auto MDI/MDI-X
Cable	Cat5 cable or better for 100Base-TX
Input Voltage	24 VAC or PoE (IEEE802.3af class 3)
Power Consumption	6 W
Current Consumption	PoE <200 mA maximum 24 VAC <295 mA nominal; <390 mA maximum

Alarm Input	10 VDC maximum, 5 mA maximum
Alarm Output	0 to 15 VDC maximum, 75 mA maximum
Lens Mount	CS mount, adjustable
Pan/Tilt Adjustment	Pan 368° Tilt 160° (10° to 170°) Rotate 355°

SPEC WRITER NOTE: List accessories used in the project.

16. Accessories

   a. Pendant mount

   b. Wall mount for pendant

   c. Corner adapter for wall mount

   d. Pole adapter for wall mount

   e. <list accessories>

SPEC WRITER NOTE: List only lenses used in the project.

17. Recommended Lenses

   a. Megapixel lens, varifocal, 2.2~6.0 mm, f/1.3~2.0

   b. Megapixel lens, varifocal, 2.8~8.0 mm,f/1.1~1.9

   c. Megapixel lens, varifocal, 2.8~12.0 mm, f/1.4~2.7

   d. Megapixel lens, varifocal, 15.0~50.0 mm, f/1.5~2.1

   e. <list megapixel lenses>

T. Indoor/Outdoor Camera Dome System

   1. The indoor/outdoor camera dome system shall include a built-in 100Base-TX network interface for live streaming to a standard Web browser.

   2. The indoor/outdoor camera dome system shall operate in openv architecture connectivity for third-party software recording solutions.

   3. The indoor/outdoor VASS camera dome system shall be a discreet camera dome system consisting of a dome drive with a variable speed/high speed pan/tilt drive unit with continuous 360° rotation; 1/4-inch high resolution color, or color/black-white CCD camera; motorized zoom lens with optical and digital zoom; auto focus; and an enclosure consisting of a back box, lower dome, and a quick-install mounting.

   4. Indoor/Outdoor fixed dome system technical specifications:

Imaging Device	1/4-inch CCD
Picture Elements	NTSC/PAL 768 x 494/752 x 582
Dynamic Range	102 dB typical/120 dB maximum (DW/CW models only)
Scanning System	2:1 interlace
Synchronization	Internal
Electronic Shutter Range	Auto (1/15–1/22,000)
Lens Type	Lens f/1.4 (focal length, 3.4~119 mm; 35X optical zoom, 12X digital zoom)
Focus	Automatic with manual override
Pan Speed	Variable between 400? per second continuous pan to 0.1° per second
Vertical Tilt	Unobstructed tilt of +2? to -92?
Manual Control Speed	Pan speed of 0.1? to 80? per second, and pan at 150? per second in turbo mode. Tilt operation shall range from 0.1? to 40? per second
Automatic Preset Speed	Pan speed of 400? and a tilt speed of 200? per second
Presets	256 positions with a 20-character label available for each position; programmable camera settings, including selectable auto focus modes, iris level, LowLight™ limit, and backlight compensation for each preset; command to copy camera settings from one preset to another; and preset programming through control keyboard or through dome system on-screen menu 128 positions with a 20-character label available for each position; programmable camera settings, including selectable auto focus modes, iris level, LowLight limit, and backlight compensation for each preset; command to copy camera settings from one preset to another; and preset programming through control keyboard or through dome system on-screen menu
Preset Accuracy	± 0.1?
Zones	8 zones with up to 20-character labeling for each, with the ability to blank the video in the zone
Limit Stops	Programmable for manual panning,

	auto/random scanning, and frame scanning
Alarm Inputs	7
Alarm Output Programming	Auxiliary outputs can be alternately programmed to operate on alarm
Alarm Action	Individually programmed for 3 priority levels, initiating a stored pattern or going to a preassigned preset position
Resume after Alarm	After completion of alarm, dome returns to previously programmed state or its previous position
Window Blanking	8, four-sided user-defined shapes, each side with different lengths; window blanking setting to turn off at user-defined zoom ratio; window blanking set to opaque gray or translucent smear; blank all video above user-defined tilt angle; blank all video below user-defined tilt angle
Patterns	8 user-defined programmable patterns including pan/tilt/zoom and preset functions, and pattern programming through control keyboard or through dome system on-screen menu
Scheduler	Internal scheduling system for programming presets, patterns, window blanks, alarms, and auxiliary functions based on internal clock settings
Auto Flip	Rotates dome 180° at bottom of tilt travel
Password Protection	Programmable settings with optional password protection
Compass Display	On-screen display of compass heading and user-definable compass setup
Camera Title Overlay	20 user-definable characters on the screen camera title display
Video Output Level	User-selectable for normal or high output levels to compensate for long video wire runs
Motion Detection	User-definable motion detection settings for each preset scene, can activate auxiliary outputs, and contains three sensitivity levels

	per zone
Electronic Image Stabilization	Electronic compensation for external vibration sources that cause image blurring; user selectable for 2 frequency ranges, 5 Hz (3-7 Hz) and 10 Hz (8-12 Hz)
Wide Dynamic Range	128X
Video Output	1 Vp-p, 75 ohms
Minimum Illumination	NTSC/EIA 0.55 lux at 1/60 sec shutter speed (color), 0.063 lux at 1/4 sec shutter speed (color), 0.00018 lux at 1/2 sec shutter speed (B-W) PAL/CCIR 0.55 lux at 1/50 sec shutter speed (color), 0.063 lux at 1/3 sec shutter speed (color), 0.00018 lux at 1/1.5 sec shutter speed (B-W)
Compression	MPEG-4, MJPEG
Video Streams	3, simultaneous
Video Resolutions	NTSC PAL 4CIF 704 x 480 704 x 576 2CIF 704 x 240 704 x 288 CIF 352 x 240 352 x 288 QCIF 176 x 120 176 x 144
Bit Rate	Configurable, MPEG-4 30 ips, 2 Mbps for primary stream, MJPEG 15 ips, 3 Mbps, MJPEG
Web User Interface	
Environment	Low temperature, indoor/outdoor
Connectors	RJ-45 for 100BASE-TX, Auto MDI/MDI-X
Cabling	CAT5 cable or better for 100BASE-TX
Input Voltage	18 to 32 VAC; 24 VAC nominal 22 to 27 VDC; 24 VDC nominal
Power Consumption	24 VAC 23 VA nominal (without heater);73 VA nominal (with heater) 24 VDC 0.7 A nominal (without heater);3 A nominal (with heater)
Alarm Input	7
Alarm Output	1
CERTIFICATIONS	CE, Class B UL Listed Meets NEMA Type 4X and IP66

	standards

SPEC WRITER NOTE: List accessories used in the project.

5. Accessories

   a. Pendant mount

   b. Wall mount for pendant

   c. Corner adapter for wall mount

   d. Pole adapter for wall mount

   e. <list accessories>

U. Reinforced Fixed Dome Camera

   1. The dome camera shall be a high-resolution color video camera with wide dynamic range capturing capability.

   2. The camera shall meet or exceed the following specifications:

      a. The camera shall have the form factor as typical of a traditional VASS dome video camera.

      b. The image capturing device shall be a 1/3-inch image sensor designed for capturing wide dynamic images.

   3. The camera shall optimize each pixel independently.

   4. The camera shall have onscreen display menus for programming of the camera's settings.

   5. The signal system shall be NTSC or PAL selectable.

   6. The resolution that the camera provides shall be [470] <insert number> television lines horizontal and [460] <insert number> television lines vertical.

   7. The camera shall have [720] <insert number> horizontal and 540 vertical picture elements.

   8. The scanning system shall be 525/60 lines NTSC or 625/50 lines PAL.

   9. The synchronizing system shall be internal/AC line-lock.

   10. The sensitivity shall be 0.6 lux at f1.2, 30 IRE.

   11. The signal-to-noise ratio shall be 50 dB.

   12. The electronic shutter shall have automatic adjustment, and operate from 1/60 NTSC to 1/100,000 second, automatic.

   13. The camera shall have an automatic white balance range of 2800 to 11000 K.

   14. The camera shall have automatic gain control.

   15. The camera shall include a shroud to conceal the camera's position inside the dome.

   16. The camera shall have composite video output.

17. The housing shall have the following specifications:

    a. Construction: Aluminum

    b. The housing shall be heavy duty and tamper resistant.

    c. Dome housing construction: 0.13-in polycarbonate.

    d. Finish: Powder coat

18. The camera shall come with a manual varifocal [4 to 9]<insert range> mm lens.

19. The electrical specifications for the camera shall be as follows:

    a. Input voltage shall be 24 VAC or 12 VDC.

    b. Power consumption shall be 12 VDC, 455 mA; or 24 VAC, 160 mA.

    c. Power source shall be universal 18 to 30 VAC or 10 to 30 VDC.

    d. Video output shall be composite: 1.0 volts peak-to-peak at 75-ohm load.

20. The environmental specifications for the camera shall be as follows: Operating temperature shall be -10 to 45 degrees Celsius or 14 to 113 degrees Fahrenheit.

> SPEC WRITER NOTE: Revise subparagraph to include camera mounts required for the project.

21. Accessories shall include:

    a. Surface mount adapter

    b. Wall mount adapter

    c. Flush mount adapter

> SPEC WRITER NOTE: Retain Paragraph 2.3 if network video cameras are included in VASS.

V. Indoor/Outdoor Fixed Mini Dome System

 1. The indoor/outdoor fixed mini dome system shall include a built-in 100Base-TX network interface for live streaming to a standard Web browser.

 2. The network mini dome shall be integrated into the back box design to accept multiple camera options without modification. The network mini dome shall operate in open architecture connectivity for third-party software recording solutions.

 3. The indoor/outdoor fixed mini dome system shall meet or exceed the following design and performance specifications.

Imaging Device	1/3-inch imager
Picture Elements	NTSC/PAL 720 (H) x 540 (V) 720 (H) x 540 (V)
Dynamic Range	102 dB typical/120 dB maximum

	(DW/CW models only)
Scanning System	2:1 interlace (progressive option on CW/DW models only
Synchronization	Internal
Electronic Shutter Range	Auto (1/15-1/22,000)
Lens Type	Varifocal with auto iris
Format Size	1/3-inch
Focal Length	3.0 mm-9.5 mm 9.0 mm-22.0 mm <list>
Operation	Iris Auto (DC-drive) Focus Manual Zoom Manual
Minimum Illumination	Color (day): 0.8 lux, SENS 8X: 0.2 lux, B-W (night): 0.08 lux, SENS 8X: 0.02 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance) Color (day): 0.15 lux, B-W (night): 0.015 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance) Color (day): 0.8 lux, SENS 8X: 0.2 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance) 0.2 lux (F1.0, 40 IRE, AGC on, 75% scene reflectance)
Compression	MPEG-4, MJPEG in Web viewing mode
Video Streams	3, simultaneous
Video Resolutions	NTSC PAL 4CIF 704 x 480 704 x 576 2CIF 704 x 240 704 x 288 CIF 352 x 240 352 x 288 QCIF 176 x 120 176 x 144
Bit Rate	Configurable, 20 kbps to 2 Mpbs per stream
Web User Interface	
Environment	Low temperature, indoor/outdoor
Connectors	RJ-45 for 100BASE-TX, Auto MDI/MDI-X
Cabling	CAT5 cable or better for 100BASE-TX
Input Voltage	24 VAC (18-36) or PoE input voltage
Power Consumption	<7.5 Watts,<13 Watts with heaters 24VAC: <0.5 Amps, <0.9 Amps with heaters

Alarm Input	10 VDC maximum, 5 mA maximum
Alarm Output	0 to 15 VDC maximum, 75 mA maximum
Service Connector	Internal to housing for 2.5 mm connector for NTSC/PAL video outputs
Service Connector	3-conductor, 2.5 mm connector for video output to optional (IS-SC cable)
Pan/Tilt Adjustment	Pan 360°, tilt 80° (20° to 100° range), and rotation 360°
Light Attenuation	smoked bubble, f/1.5 light loss; clear bubble, zero light loss
CERTIFICATIONS	CE, Class B UL Listed Meets NEMA Type 4X and IP66 standards

SPEC WRITER NOTE: List accessories used in the project.

4. Accessories

a. Pendant mount

b. Wall mount for pendant

c. Corner adapter for wall mount

d. Pole adapter for wall mount

e. <list accessories>

W. Megapixel High Definition Integrated Digital Network Camera

1. The network camera shall offer dual video streams with up to 3.1 megapixel resolution (2048 x 1536) in progressive scan format.

2. An alarm input and relay output shall be built in for integration with hard wired external sensors.

3. The network camera shall be capable of firmware upgrades through a network using a software-based device utility.

4. The network camera shall offer auto back focus (ABF) functionality through a push button on the camera. ABF parameters shall also be configurable through a standard Web browser interface.

5. The network camera shall offer a video output port providing an NTSC/PAL analog video output signal for adjusting field of view and focus at the camera.

6. The network camera shall provide advanced low-light capabilities for color and day/night models with sensitivity down to 0.12 lux in color and 0.03 lux in black-white (B-W).

7. The network camera shall have removable IR cut filter mechanism for increased sensitivity in low-light installations. The sensitivity of IR cut filter removal shall be configurable through a Web browser.

8. The network camera shall support two simultaneous, configurable video streams. H.264 and MJPEG compression formats shall be available for primary and secondary streams with selectable unicast and multicast protocols. The streams shall be configurable in a variety of frame rates and bit rates.

9. The network camera shall support industry standard Power over Ethernet (PoE)

10. IEEE 802.3af to supply power to the camera over the network. The network camera shall also offer a 24 VAC power input for optional use.

11. The network camera shall use a standard Web browser interface for remote administration and configuration of camera parameters.

12. The network camera shall have a window blanking feature to conceal user-defined privacy areas that cannot be viewed by an operator. The network camera shall support up to four blanked windows. A blanked area shall appear on the screen as a solid gray window.

13. The network camera shall support standard IT protocols.

14. The network camera shall support open architecture best practices with a published API available to third-party network video recording and management systems.

X. Megapixel High Definition Integrated Digital Network Camera Technical Specifications:

SPEC WRITER NOTE: Edit the table below to include technical specifications as required by the project.

Imaging Device	1/3-inch, effective
Imager Type	CMOS, Progressive scan
Maximum Resolution	2048 x 1536
Signal-to-Noise Ratio	50 dB
Auto Iris Lens Type	DC drive
Electronic Shutter Range	1~1/100,000 sec
Wide Dynamic Range	60 dB
White Balance Range	2,000° to 10,000°K
Sensitivity	f/1.2; 2,850K; SNR >24dB Color (1x/33ms) 0.50 lux Color SENS

	(15x/500 ms) 0.12 lux Mono SENS (15x/500 ms) Mono (1x/33ms)0.25 lux 0.03 lux
Dome Attenuation	Clear Zero light loss Smoke f/1.0 light loss
Compression	H.264 in base profile and MJPEG
Video Streams	Up to 2 simultaneous streams, the second Stream variable based on the setup of the primary stream
Frame Rate	Up to 30, 25, 24, 15, 12.5, 12, 10, 8, 7.5, 6.5, 4, 3, 2, and 1 (depending upon coding, resolution, and stream configuration
Available Resolutions	3.1 MPx2048 x 1536; 4:3 aspect ratio; 2.0 ips max., 10.0 Mbps bit rate for MJPEG; 3.0 ips max., 2.6 Mbps bit rate H.264 2.1 MPx1920 x 1080; 16:9 aspect ratio: 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 5.0 ips max., 2.7 Mbps bit rate H.264 3.1.9 MPx1600 x 1200; 4:3 aspect ratio; 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 6.0 ips max., 2.6 Mbps bit rate H.264 1.3 MPx1280 x 1024; 5:4 aspect ratio; 15.0 ips max.,10.0 Mbps bit rate for MJPEG; 8.0 ips max., 2.5 Mbps bit rate H.264 1.2 MPx1280 x 960; 4:3 aspect ratio; 15.0 ips max., 9.8 Mbps bit rate for MJPEG; 9.8 ips max., 8.5 Mbps bit rate H.264 6.0.9 MPx1280 x 720; 16:9 aspect ratio; 30.0 ips max.,10.0 Mbps bit rate for MJPEG; 12.5 ips max., 2.5 Mbps bit rate H.264 0.5 MPx800 x 600; 4:3 aspect ratio; 30.0 ips max., 5.8 Mbps bit rate for MJPEG; 25.0 ips max., 2.0 Mbps bit rate H.264 8.0.3 MPx640 x 480; 4:3 aspect ratio; 30.0 ips max., 3.7 Mbps bit rate for MJPEG; 30.0 ips max.,1.6 Mbps bit rate H.264 0.1 MPx320 x 240; 4:3 aspect ratio; 30.0 ips max., 0.9 Mbps bit rate for MJPEG; 30.0 ips max., 0.4 Mbps bit rate H.264 Additional640 x 512, 640 x 352, 480 x 368, 480 x 272, 320 x 256, 320 x 176

Supported Protocols	TCP/IP, UDP/IP (Unicast, Multicast IGMP), UPnP, DNS, DHCP, RTP, RTSP, NTP,IPv4, SNMP, QoS, HTTP, HTTPS, LDAP(client), SSH, SSL, STMP, FTP, MDNS(Bonjour), and 802.1x (EAP)
Security Access	Password protected
Software Interface	Web browser view and setup, up to 16 cameras
Connectors	RJ-45 for 100Base-TX, Auto MDI/MDI-X
Cable	Cat5 cable or better for 100Base-TX
Input Voltage	24 VAC or PoE (IEEE802.3af class 3)
Power Consumption	6 W
Current Consumption	PoE <200 mA maximum 24 VAC <295 mA nominal; <390 mA maximum
Alarm Input	10 VDC maximum, 5 mA maximum
Alarm Output	0 to 15 VDC maximum, 75 mA maximum
Lens Mount	CS mount, adjustable
Pan/Tilt Adjustment	Pan 368° Tilt 160° (10° to 170°) Rotate 355°

> SPEC WRITER NOTE: List accessories used in the project.

1. Accessories

    a. Pendant mount

    b. Wall mount for pendant

    c. Corner adapter for wall mount

    d. Pole adapter for wall mount

    e. <list accessories>

> SPEC WRITER NOTE: List only lenses used in the project.

2. Recommended Lenses

    a. Megapixel lens, varifocal, 2.2~6.0 mm, f/1.3~2.0

    b. Megapixel lens, varifocal, 2.8~8.0 mm,f/1.1~1.9

    c. Megapixel lens, varifocal, 2.8~12.0 mm, f/1.4~2.7

    d. Megapixel lens, varifocal, 15.0~50.0 mm, f/1.5~2.1

    e. <list megapixel lenses>

Y. NETWORK CAMERAS

1. Shall be IEEE 802.3af compliant.

    a. Shall be utilized for interior and exterior purposes.

b. A Category [CAT5]/[CAT6]<choose one> cable will be the primary source for carrying signals up to 100 m(300 ft.) from a switch hub or network server. If any camera is installed greater than 100 m (300 ft.) from the controlling device then the following will be required:

    1) A local or remote 12 VDC or 24 VAC power source will be required from a Class 2, UL compliant power supply.

    2) A signal converter will be required to convert from a [CAT5]/[CAT6]<choose one> cable over to a fiber optic or standard signal cable. The signal will need to be converted back to a [CAT5]/[CAT6]<choose one> cable at the controlling device using a signal converter card.

c. Shall be routed to a controlling device via a network switch.

> SPEC WRITER NOTE: Delete subparagraph below if camera application in project does not require analog output.

d. Shall be of hybrid design with both an Internet Protocol (IP) output and a monitor video output which produces a picture equivalent to an analog camera, and allows simultaneous output of both.

e. Shall be a programmable IP address that allows for installation of multiple units in the same Local Area Network (LAN) environment.

d. Incorporate a minimum of Transmission Control Protocol (TCP)/IP, User Datagram Protocol (UDP), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Internet Control Message Protocol (ICMP0, Address Resolution Protocol (ARP), Real-Time Transport Protocol (RTP), Dynamic Host Configuration Protocol (DHCP), Network Time Protocol (NTP), Simple Mail Transfer Protocol (SMTP), Internet Group Management Protocol (IGMP), and Differentiated Service Code Point (DSCP) protocols for various network applications.

Z. Fixed Network Camera

    1. The fixed network camera shall have following technical characteristics:

> SPEC WRITER NOTE: Copy and/or edit table in following paragraph to accommodate for all fixed network color camera models in the project.

Video Standards	MPEG-4; M-JPEG
Video Data Rate	9.6 Kbps - 6 Mbps Constant & variable
Image Resolution	768x494 (NTSC)
Video Resolution	704 x 576/480 (4CIF: 25/30 IPS) 704 x 288/240 (2CIF: 25/30 IPS) 352 x 288/240 (CIF: 25/30 IPS) 176 x 144/120 (QCIF: 25/30 IPS)
Select Frame Rate	1-25/30 IPS (PAL/NTSC);Field/frame based coding
Network Protocols	RTP, Telnet, UDP, TCP, IP, HTTP, IGMP, ICMP
Software Update	Flash ROM, remote programmable
Configuration	Via web browser, built-in web server interfaces
//Video Out	1x Analog composite: NTSC or PAL; BNC connector 75 Ohm//
Sensitivity	1 0.65 lux (color) 0.26 lux (NightSense)
Minimum Illumination	0.30 lux (color)0.12 lux (NightSense)
Video Signal-to-Noise Ratio	50 dB
Video Signal Gain	21 dB, (max) Electronic Shutter Automatic, up to 1/150000 sec. (NTSC)
Alarm In	Automatic sensing (2500 - 9000 K)
Input Voltage	+5 V nominal, +40 VDC max VDC: 11-36 V (700 mA) VAC: 12-28 V (700 mA) PoE: IEEE 802.3af compliant

    2. Camera accessories shall include:

        a. Surface mount adapter

        b. Wall mount adapter

        c. Flush mount adapter

        d. <list>

AA. Wireless Cameras

    1. Prior to installation of any wireless camera, ensure operating frequency is given full approval by the VA controlling authority.

Wireless cameras shall be utilized as either part of a VASS network or a standard analog system.

2. Power for a wireless camera will be 110 VAC tied into a dedicated circuit breaker on a power panel that is dedicated to the security system and is fed from a power source with back-up in the event primary power to the VASS System is lost. Power will be run to the camera and connected at both ends in accordance with Division 26 of the VA Master Specification FOR NCA Projects, and the VA Electrical Manual. In addition, wireless systems are line of sight dependant and all considerations for environmental layout must be taken into consideration prior to design, engineering, and installation of this type of camera system. Proximity to transmitting and receiving devices, cell phone towers, and any and all electrical devices can also cause interference with the camera signal and must be considered in advance.

3. Shall be located within a minimum of one quarter of a mile from the receiving unit. Repeaters shall be used as required to ensure the strongest possible signal between transmitters and receivers.

4. Shall be Federal Communication Commission (FCC) approved and compliant.

5. If using wireless cameras, the following equipment shall be utilized to ensure operation of the system:
   a. Receiver
   b. Receiver antenna as required
   c. Repeater as required
   d. Mounting Hardware

6. Receivers shall only handle up to four (4) cameras per unit.

7. Technical Characteristics
   a. Wireless Cameras:

Imaging Device	1/3-inch interline transfer CCD
Picture Elements	NTSC 510 (H) x 492 (V)
Sensing Area	6 mm diagonal
Scanning System	NTSC 525 lines, 21 interlace
Synchronization System	AC line lock/internal
Horizontal Resolution	330 TV lines
Iris Control	Selectable on/off
Electronic Shutter Range NTSC	1/60-1/100,000 second

Frequency range	2.41-2.47GHz
Modulation	FM
Video signal/noise ratio	48dB
Audio signal/noise ratio	45db
Minimum Illumination	0.6 lux
Signal to Noise Ratio	>50 dB
Automatic Gain Control	On/off switchable
Backlight Compensation	On/off switchable
Auto White Balance	On/off switchable
Video Output	1 Vp-p, 75 ohms
Lens Mount	C/CS mount (adjustable)

b. Receivers

Frequency range	2.4-2.49GHz
Video output	1Vp-p
Signal/noise ratio	38dB

BB. LENSES

1. Camera Field of View shall be set by the Contractor to produce full view of door or window opening and anyone entering or leaving through it. Follow the project construction drawings for design intent.

2. Camera Lenses shall be of the type supplied with the camera from the manufacture. All cameras which are not supplied with lenses from the factory are specified in this specification. The lens shall be equipped with an auto-iris mechanism unless otherwise specified. Lenses having auto-iris, DC iris, or motor zoom functions shall be supplied with connectors, wiring, receiver/drivers, and controls as needed to operate the lens functions. Lenses shall have sufficient circle of illumination to cover the image sensor evenly. Lenses shall not be used on a camera with an image format larger than the lens is designed to cover. Lenses shall be provided with pre-set capability.

3. Lenses shall have optical-quality coated optics, designed specifically for video surveillance applications, and matched to specified camera. Provide color-corrected lenses with color

cameras, megapixel lenses for megapixel cameras, and lenses with day/night for color/b&w cameras.

4. Auto-Iris Lens: Electrically controlled iris with circuit set to maintain a constant video level in varying lighting conditions.

5. Zoom Lenses: Motorized, remote-controlled units, rated as "quiet operating." Features include the following:

   a. Electrical Leads: Filtered to minimize video signal interference.

   b. Motor Speed: Variable.

   c. Lens shall be available with preset positioning capability to recall the position of specific scenes.

6. Lenses: Shall be utilized in a manner that provides maximum coverage of the area being monitored by the camera. The lenses shall:

   a. Be 1/3" to fit CCD fixed camera.

   b. Be all glass with coated optics.

   c. Have mounts that are compatible with the camera selected.

   d. Be packaged and supplied with the camera.

   e. Have a maximum f-stop of f/1.3 for fixed lenses, and a maximum f-stop of f/1.6 for variable focus lenses.

   f. Be equipped with an auto-iris mechanism.

   g. Have sufficient circle of illumination to cover the image sensor evenly.

   h. Not be used on a camera with an image format larger than the lens is designed to cover.

   i. Be provided with pre-set capability.

7. Two types of lenses shall be utilized for both interior and exterior fixed cameras:

   a. Manual Variable Focus

   b. Auto Iris Fixed

8. Manual Variable Focus:

   a. Shall be utilized in large areas that are being monitored by the camera. Examples of this are perimeter fence lines, vehicle entry points, parking areas, etc.

   b. Shall allow for setting virtually any angle of field, which maximizes surveillance effects.

   c. Technical Characteristics:

Image format	1/3 inch
Focal length	5-50mm

Iris range	F1.4 to close
Focus range	1m (3.3 ft)
Back focus distance	10.05 mm (0.4 in)
Angle view Wide (1/3 in)	53.4 x 40.1
Angle view Tele (1/3 in)	5.3 x 4.1
Iris control	manual
Focus ctrl	manual
Zoom ctrl	manual

CC. CAMERA HOUSINGS AND MOUNTS

1. This section pertains to all interior and exterior housings, domes, and applicable wall, ceiling, corner, pole, and rooftop mounts associated with the housing. Housings and mounts shall be specified in accordance to the type of cameras used.

2. All cameras and lenses shall be enclosed in a tamper resistant housing. Any additional mounting hardware required to install the camera housing at its specified location shall be provided along with the housing.

3. The camera and lens contained inside the housing shall be installed on a camera mount. All additional mounting hardware required to install the camera housing at its specified location shall be provided along with the housing.

4. Shall be manufactured in a manner that are capable of supporting a maximum of three (3) cameras with housings, and meet environmental requirements for the geographical area the camera support equipment is being installed on or within.

5. Environmentally Sealed
   a. Shall be designed in manner that it provides a condensation free environment for correct camera operation.
   b. Shall be operated in a 100 percent condensing humidity atmosphere.
   c. Shall be constructed in a manner that:
      1) Has a fill valve to allow for the introduction of nitrogen into the housing to eliminate existing atmospheric air and pressurize the housing to create moisture free conditions.
      2) Has an overpressure valve to prevent damage to the housing in the event of over pressurization.

     3) Is equipped with a humidity indicator that is visible to the eye to ensure correct atmospheric conditions at all times.

     4) The leak rate of the housing is not to be greater than 13.8kPa or 2 pounds per square inch at sea level within a 90 day period.

     5) It shall contain camera mounts or supports as needed to allow for correct positioning of the camera and lens.

     6) The housing and sunshield are to be white in color.

  6. All electrical and signal cables required for correct operations shall be supplied in a hardened carrier system from the controller to the camera.

  7. The mounting bracket shall be adjustable to allow for the housing weight of the camera and the housing unit it is placed in.

  8. Accessibility to the camera and mounts shall be taken into consideration for maintenance and service purposes.

DD. Indoor Mounts

  1. Ceiling Mounts:

   a. This enclosure and mount shall be installed in a finished or suspended ceiling.

   b. The enclosure and mount shall be fastened to the finished ceiling, and shall not depend on the ceiling tile grid for complete support.

   c. Suspended ceiling mounts shall be low profile, and shall be suitable for replacement of 610mm x 610mm (2 foot by 2 foot) ceiling tiles.

  2. Wall Mounts:

   a. The enclosure shall be installed in manner that it matches the existing décor and placed at a height that it will be unobtrusive, unable to cause personal harm, and prevents tampering and vandalism.

   b. The mount shall contain a manual pan/tilt head that will provide 360 degrees of horizontal and vertical positioning from a horizontal position, and has a locking bar or screw to maintain its fixed position once it has been adjusted.

EE. Interior Domes

  1. The interior dome shall be a pendant mount, pole mount, ceiling mount, surface mount, or corner mounted equipment.

2. The lower portion of the dome that provides camera viewing shall be made of black opaque acrylic and shall have a light attenuation factor of no more that 1 f-stop.

3. The housing shall be equipped with integral pan/tilt capabilities complete with wiring, wiring harness, connectors, receiver/driver, pan/tilt control system, pre-position cards, or any other hardware and equipment as needed to fully provide a fully functional pan/tilt dome.

4. The pan/tilt mechanism shall be:
   a. Constructed of heavy duty bearings and hardened steel gears.
   b. Permanently lubricated to ensure smooth and consistent movement of all parts throughout the life of the product.
   c. Equipped with motors that are thermally or impedance protected against overload damage.
   d. Pan movements shall be 360 degrees and tilt movement shall no be less than +/- 90 degrees.
   e. Pan speed shall be a minimum of 10 degrees per second.

FF. Exterior Domes
   1. The exterior dome shall meet all requirements outlined in the interior dome paragraph above.
   2. The housing shall be constructed to be dust and water tight, and fully operational in 100 percent condensing humidity.

GG. Exterior Wall Mounts
   1. Shall have an adjustable head for mounting the camera.
   2. Shall be constructed of aluminum, stainless steel, or steel with a corrosion-resistant finish.
   3. The head shall be adjustable for not less than plus and minus 90 degrees of pan, and not less than plus and minus 45 degrees of tilt. If the bracket is to be used in conjunction with a pan/tilt, the bracket shall be supplied without the adjustable mounting head, and shall have a bolt-hole pattern to match the pan/tilt base.
   4. Shall be installed at a height that allows for maximum coverage of the area being monitored.

HH. Explosion Proof Housing
   1. This housing shall meet or exceed all requirements of NEMA four (4) standards for hazardous locations.
   2. It shall be supplied with the mounting brackets for the specified camera and lens.

2.8 POWER SUPPLIES

A. Power supplies shall be a low-voltage power supplies matched for voltage and current requirements of cameras and accessories, type as recommended by camera[, infrared illuminator,] and lens manufacturer.

> SPEC WRITER NOTE: Revise sub-paragraphs below as required by the project. Specify power supply with sufficient number of outputs for all devices in the project. Minimum of one output per camera shall be provided.

B. Technical specifications:

1. Input: 115VAC, 50/60Hz, 2.7 amps

2. Outputs:

   a. Number of outputs, [16] <insert number of outputs>

   b. [Fuse/PTC] <insert type> protected, power limited

   c. Output voltage & power:

      1) 24VAC @ 12.5 amps (300VA) or 28VAC @ 10 amp (280VA) supply current

3. Illuminated power disconnect circuit breaker with manual reset

4. Surge suppression

5. Camera synchronization

6. [Wall/Rack] <insert mount type> mount.

7. Enclosure: NEMA 250, Type [1] [3] [4X] <Insert enclosure type>.

> SPEC WRITER NOTE: Leave paragraph below if VASS designed requires analog cameras to be connected to IP camera based system.

2.9 INFRARED ILLUMINATORS

A. Lighting fixtures that emit light only in the infrared spectrum, suitable for use with cameras indicated, for nighttime surveillance, without emitting visible light.

1. Field-Selectable Beam Patterns: Narrow, medium, and wide.

2. Rated Lamp Life: More than 8000 hours

3. Power Supply: [12-VAC/DC] [120-VAC].

B. Area Coverage: Illumination to 50 m (150 feet) in a narrow beam pattern.

C. Exterior housings shall be suitable for same environmental conditions as associated camera.

2.10 NETWORK SERVER

A. Allow for the transmission of live video, data, and audio over either an existing Ethernet network or a dedicated security system network,

requiring an IP address or Internet Explorer 5.5 or higher, or shall work as an analog-to-Ethernet "bridge" controlling matrices, multiplexers, and pan/tilt/zoom cameras. The network shall operate in a box-to-box configuration allowing for encoded video to be decoded and displayed on an analog monitor.

B. If a VASS System network is going to be utilized as the primary means of monitoring, operating, and recording cameras then the following equipment shall be required as part of the system:

1. System Server

2. Computer Workstation

3. Recording Device

4. Encoder/Decoder

5. Monitor

6. Hub/Switch

7. Router

8. Encryptor

C. Shall provide overall control, programming, monitoring, and recording of all cameras and associated devices within the VASS System.

D. All equipment on the network shall be IP addressable.

E. The VASS System network shall meet or exceed the following design and performance specifications:

1. Two MPEG-4 video streams for a total of 40 images per second will be provided.

2. PC Software that manages the installation and maintenance of all hardware transmitters and receivers on the network shall be provided.

3. Video Source that supports any NTSC video source to the computer network shall be addressed.

4. Receivers that could be used to display the video on a standard analog NTSC or PAL monitor will be addressed.

F. The system shall support the following network protocols:

1. Internet connections: RTP, Real Time Control Protocol (RTCP), UDP, IP, TCP, ICMP, HTTP, Simple Network Management Protocol (SNMP), IGMP, DHCP, and ARP.

2. Video Display: MPEG-4, M-JPEG in server push mode only.

3. Have the ability to adjust bandwidth, image quality and image rate.

4. Support image sizes of either 704 x 576 pixels or 352 x 288 pixels.

5. Have an audio coding format of G.711 or G.728.

6. Provide a video frame rate of at least 30 images per second.

7. Support LAN Interface Ethernet 10/100BaseT and be auto sensing.

8. Have a LAN Data Rate of 9.6 Kbps to 5.0 Mbps.

9. Utilize data interface RS-232/RS-422/RS-485.

G. All connections within the system shall be via CAT-5 cable and RJ-45 jacks. If analog equipment is used as part of the system, then either an encoder or a decoder will be utilized to convert the analog signal to a digital one.

H. The VASS network system shall conform to all VA agency wide security standards for administrator and operator use.

I. Server Technical Characteristics:

Hardware	Personal Computer
CPU	Pentium IV, 3.0 GHz or better
Hard Disk Interface	IDE or better
RAM	256 MB
OS	Windows XP Home/XP Professional
Graphic Card	NVIDIA GeForce 6600 NVIDIA Quadro FX 1400 ATI RADEON X600/X800 or better
Ethernet Card	100 Mb
Software	DirectX 9.0c
Free Memory	120 MB

J. Network Switch Technical Characteristics

Protocol and standard	IEEE802.3 IEEE802.3u IEEE802.3ab
Ports	24 10/100/1000M auto-negotiation RJ-45 ports with auto MDI/MDI-X
Network media	Cat 5 UTP for 1,000Mbps Cat 3 UTP for 10Mbps
Transmission method	store-and-forward
LED	indicator power, act/link, speed

K. Router Technical Characteristics

Network Standards	IEEE 802.3, 802.3u 10Base-T Ethernet (WAN) 100Base-T Ethernet (LAN) IEEE 802.3x Flow Control IEEE802.1p Priority Queue ANS/IEEE 802.3 NWay auto-negotiation
Protocol	CSMA/CD, TCP, IP, UDP, PPPoE, AND DHCP (client and server)

VPN Supported	PPTP, IPSec pass-through
Management	Browser
Ports	4 x 10/100Base-T Auto sensing RJ45 ports, and an auto uplink RJ45port(s) 1 x 10Base-T RJ45 port, WAN
LEDs	Power, WAN Activity, LAN Link (10/100), LAN Activity

L. Encryptor Technical Characteristics:

Cryptography	Standard – Triple DES 168-bit (ANSI 9.52) Rijndael – AES (128, 192, 256)
Performance	Throughput (end-to-end) @ 100 Mbps line speed: >188 Mbps full duplex (large frames) >200 kfps full duplex (small frames) Latency (end-to-end) @ 100 Mbps
Key Management	Automatic KEK/DEK Exchange Using Signed Diffie-Hellman Unit Authentication Using X.509 Certificates
Physical Interfaces	10BaseT or 10/100BaseT Ethernet (Host and Network Ports) 10BaseT Ethernet Management Port Back and Front-Panel Serial Control Port
Device Management	THALES Element Manager, Front Panel Viewer, and Certificate Manager 10Base T (RJ-45) or 9-pin Serial Control Port SNMP Network Monitoring
Security Features	Tamper Proof Cryptographic Envelope Tamper Evident Chassis Hardware Random Number Generator
Management	Channel Encrypted Using Same Algorithm as Data Traffic
Security Certifications	FIPS 140-2 Level 3 CAPS Baseline and Enhanced Grades Common Criteria EAL4 and EAL5 (under evaluation)
Regulatory	EN60950, FCC, UL, CE, EN 50082-1, and EN 55022

2.11 RECORDING DEVICES

A. All cameras on the VASS System shall be recorded in real time using a Digital Video Recorder (DVR), Network Video Recorder (NVR), or attached storage. The type of recording device utilized should be determined by the size and type of VASS System designed and installed, and to what extent the system is to be utilized.

B. All recording devices shall be 47.5 cm (19 inch) rack-mountable.

C. All DVR's and NVR's that are viewable over an Intranet or Internet will be routed through an encryptor.

D. Encryptors shall:

1. Comply with FIPS PUB 140-2.

2. Support TCP/IP.

3. Directly interfaces to low-cost commercial routers.

4. Provide packet-based crypto synchronization.

5. Encrypt source and destination IP addresses.

6. Support web browser based management requiring no additional software.

7. Have a high data sustained throughput — 1.544 Mbps (T1) full duplex data rate.

8. Provide for both bridging and routing network architecture support.

9. Support Electronic Key Management System (EKMS) compatible.

10. Have remote management ability.

11. Automatically reconfigure when secure network or wide area network changes.

E. Digital Video Recorder (DVR)

1. Shall record video to a hard drive-based digital storage medium in either NTSC or MPEG format.

2. Shall meet the following minimum requirements:

a. Record at minimum rate of 30 images per second (IPS).

b. Have a minimum of eight (8) to 16 looping inputs.

c. Have a minimum of eight (8) to 16 alarm inputs and two (2) relay outputs.

d. Shall provide instantaneous playback of all recorded images.

e. Be IP addressable, if part of a VASS network.

f. Have built-in digital motion detection with masking and sensitivity adjustments.

g. Provide easy playback and forward/reverse search capabilities.

h. Complete audit trail database, with minimum of a six-month history that tracks all events related to the alarm; specifically who, what, where and when.

i. DVR management capability providing automatic video routing to a back-up spare recorder in case of failure.

j. Accessible locally and remotely via the Internet, Intranet, or a personal digital assistant (PDA).

    k. Records all alarm events in real time, ensuring 60 seconds before
       and after the event are included in the recording.

    l. Utilize RS-232 or fiber optic connections for integration with
       the SMS computer station via a remote port on a network hub.

    m. Allow for independently adjustable frame rate settings.

    n. Be compatible with the matrix switcher utilized to operate the
       cameras. The DVR could be utilized as a matrix switcher only if
       it meets all of the requirements listed in the matrix switcher
       section.

  3. Technical Characteristics:

                           SPEC WRITER NOTE: Edit values in [] to
                           fit project reqirements.

Compression	MPEG-4
Internal Storage Capacities.	[160] GB, [320] GB, [500] GB, [1] TB, and 2 TB. Available USB hard drive up to 250 GB. Optional internal DVD available
Digital Recording	Up to [16] video and [8] audio channels, or [8] video and [4] audio channels.
Full real-time video recording	Up to 400 IPS@352 x 288: PAL Up to 200 IPS@352 x 288: PAL
Multiple simultaneous functions	Live viewing, Recording, playback, network transmission, back-up
Search functions	Date/time search, event search, bookmark search, smart (pixel) Search
PTZ Control	Third party PTZ control
User ID security	3 levels
Connectivity to external devices:	Eight [8] or sixteen [16] video input and looping output channels. VGA and dual monitor BNC outputs. Four [4] or eight [8] audio inputs and one [1] audio output. Ethernet 10/100BaseT network connection. Eight [8] to sixteen [16] alarm inputs and four [4] or eight [8] relay outputs. Biphase connection to control Bosch PTZ cameras. Third party PTZ control via RS-422/RS-485 connection. Front and back USB connectors to

	connect to a PC mouse, or archive video to a USB memory stick or similar device.
PC requirements	Windows 2000 or above; DirectX 8.1 or above.
	Intel Pentium III or above, AMD Athlon with 800 MHz or faster CPU.
	512 MB or more RAM.
	50 MB hard drive.
	AGP VGA with 64 MB video RAM or above.
	10/100-BaseT network interface.
Electrical	Power Input: 100 to 240 VAC; 50/60 Hz
	Power consumption: [120W]
	Max. [1.2] A
Video	Video standard: PAL or NTSC selectable.
	Resolution: 704 x 576 PAL, 704 x 480 NTSC
	Compression: MPEG-4
	Inputs: 8 or 16 composite video 0.5-2 Vpp, 75 Ohm automatic termination.
	Outputs 8 or 16 composite video 1 Vpp, 75 Ohm.
Audio	Inputs: 4 or 8 line in, 30 kOhm
	Output: 1 line, 100 kOhm
Monitors	VGA: analog RGB 800x600
	MON A: CVBS 1 Vpp?0.1 V, 75 Ohm, BNC
	Monitor A multi-screen (VGA or CVBS)
	MON B: CVBS 1 Vpp?0.1 V, 75 Ohm, BNC
	Monitor B spot/alarm
Frame Rate and Resolution	[16]-channels PAL: Up to 400 IPS@352x288, up to 200 IPS@704x288, up to 100 IPS@704x576.
Alarm inputs	[8] [16] configurable NO/NC, max. input 5 VDC.
Alarm outputs	[4] or [8] relay outputs, configurable NO/NC, max. rated 1A, 125 VAC.
Connections	Ethernet: RJ45 modular jack 8 pins shielded, 10/100 Base-T.
	Biphase: Screw terminal connector (5 outputs).
	Maximum 5 controllable cameras per Biphase output.
	PTZ control interfaces: RS485/RS422.
	Serial interface: RS232 output signal, DB9 male connector

	Keyboard: RJ11 modular jack 6 pins
Network:	Transmission speed: up to 120 IPS@352x240
	Bandwidth control: Automatic
	Remote users: Maximum 5 simultaneous connected Control Center users.

Processor	Intel Pentium III 750 MHz
Memory	256 MB RAM
Operating System	Windows 98, NT, ME, 2000, and XP
Video Card	4 MB of RAM capable of 24-bit true color display
Free Hard Disk Space	160 MB for software installation
Network Card	10Base-T network for LAN operation
Archiving	80 GB, 160 GB, 320 GB and 640 GB Hard Drive; CD-RW
Video Input	1.0 Vpp (signal 714mV, sync 286mV) 75 ohms (BNC unbalanced)
Video Output Level	1.0 Vpp +/-10%,75 ohms(BNC unbalanced)
Impedance	75 ohms/Hi- impedance x 16 switchable
Network Interface	Ethernet (RJ-45, 10/100M)
Network Protocol	TCP/IP, DHCP, HTTP, UDP
Network Capabilities	Live/Playback/P/T/Z control
Recording Rate	30 ips for 720 x 240 (NTSC)
Password Protection	Menu Setup, Remote Access
Recording Capacity	160 (1 or 2 fixed HDD) 1 CD-RW
Power Interrupt	Auto recovered to recording mode

F. Network Video Recorder (NVR)

   1. Shall record video to a hard drive-based digital storage medium in MPEG, MPEG4 or H.264 format.

   2. Shall meet the following minimum requirements:

      a. Record at minimum rate of 30 IPS.

      b. Have a minimum of eight (8) to 16 looping inputs.

      c. Have a minimum of eight (8) to 16 alarm inputs and two (2) relay outputs.

      d. Shall provide instantaneous playback of all recorded images.

e. Be IP addressable, if part of a VASS network.

f. Have built-in digital motion detection with masking and sensitivity adjustments.

g. Easy playback and forward/reverse search capabilities.

h. Complete audit trail database, with minimum of a six-month history that tracks all events related to the alarm; specifically who, what, where and when.

i. NVR management capability providing automatic video routing to a back-up spare recorder in case of failure.

j. Accessible locally and remotely via the internet, intranet, or a personal digital assistant (PDA).

k. Records all alarm events in real time, ensuring 60 seconds before and after the event are included in the recording.

l. Utilize RS-232 or fiber optic connections for integration with the SMS computer station via a remote port on a network hub.

m. Allow for independently adjustable frame rate settings.

n. Be compatible with the matrix switcher utilized to operate the cameras.

3. Technical Characteristics:

Hardware/CPU	Pentium III Xeon or IV, 1.8 GHz
HDD Interface	IDE or better; optional: SCSI II, SCSI Ultra, or Fiber Channel
RAM	1024 MB
Operating System	Windows 2000/XP Professional/Server 2003 Standard
Graphic	Card VGA
Ethernet Card	100/1000 MB
Memory	20 MB
Software Setup	Centralized setup from each authorized PC; access via integrated web server
Storage Media	All storage media possible (e.g., HD, RAID), depending on operating system
Storage Mode	Linear mode, ring mode (capacity-based)
Recording Configuration	Camera name assignment, bandwidth limit, frame rate, video quality
Recording Content	Video and/or audio data
Search Parameters	Time, date, event
Playback	Playback via any IP network (LAN/WAN) simultaneous recording, playback, and backup

Network Interface	Ethernet (RJ-45, 10/100M)
Network Protocol	TCP/IP, DHCP, HTTP, UDP
Network Capabilities	Live/Playback/P/T/Z control
Recording Rate	30 ips for 720 x 240 (NTSC)
Password Protection	Menu Setup, Remote Access
Recording Capacity	160 (1 or 2 fixed HDD) 1 CD-RW
Power Interrupt	Auto recovered to recording mode

2.12 WIRES AND CABLES

A. Shall meet or exceed the manufactures recommendation for power and signal.

B. Will be carried in an enclosed conduit system, utilizing electromagnetic tubing (EMT) to include the equivalent in flexible metal, rigid galvanized steel (RGS) to include the equivalent of liquid tight, polyvinylchloride (PVC) schedule 40 or 80.

C. All conduits will be sized and installed per the NEC. All security system signal and power cables that traverse or originate in a high security office space will contained in either EMT or RGS conduit.

D. All conduit, pull boxes, and junction boxes shall be clearly marked with colored permanent tape or paint that will allow it to be distinguished from all other conduit and infrastructure.

E. Conduit fills shall not exceed 50 percent unless otherwise documented.

F. A pull string shall be pulled along and provided with signal and power cables to assist in future installations.

G. At all locations where there is a wall penetration or core drilling is conducted to allow for conduit to be installed, fire stopping materials shall be applied to that area

H. High voltage and signal cables shall not share the same conduit and shall be kept separate up to the point of connection. High voltage for the security system shall be defined as any cable or sets of cables carrying 30 VDC/VAC or higher.

I. For all equipment that is carrying digital data between the Physical Access Control System and Database Management or at a remote monitoring station, shall not be less that 20 AWG and stranded copper wire for each conductor. The cable or each individual conductor within the cable shall have a shield that provides 100% coverage. Cables with a single overall shield shall have a tinned copper shield drain wire.

J. All cables and conductors, except fiber optic cables, that act as a control, communication, or signal lines shall include surge protection. Surge protection shall be furnished at the equipment end and additional triple electrode gas surge protectors rated for the application on each wire line circuit shall be installed within 1 m. (3 ft.) of the building cable entrance. The inputs and outputs shall be tested in both normal and common mode using the following wave forms:

1. A 10 microsecond rise time by 1000 microsecond pulse width waveform with a peak voltage of 1500 watts and peak current of 60 amperes.

2. An 8 microsecond rise time by 20 microsecond pulse width wave form with a peak voltage of 1000 volts and peak current of 500 amperes.

K. The surge suppression device shall not attenuate or reduce the video or sync signal under normal conditions. Fuses and relays shall not be used as a means of surge protection.

L. Coaxial Cables

1. All video signal cables for the VASS System, with exception to the PoE cameras, shall be a coaxial cable and have a characteristic impedance of 75 ohms plus or minus 3 ohms.

2. For runs up to 750 feet use of an RG-59/U is required. The RG-59/U shall be shielded which provides a minimum of 95 percent coverage, with a stranded copper center conductor of a minimum 23 AWG, polyethylene insulation, and black non-conductive polyvinylchloride (PVC) jacket.

3. For runs between 750 feet and 1250 feet, RG-6/U is required. RG-6/U shall be shielded which provides a minimum of 95 percent coverage, with a stranded copper center conductor of a minimum 18 AWG, polyethylene insulation, and black non-conductive polyvinylchloride (PVC) jacket.

4. For runs of 1250 to 2750 feet, RG-11/U is required. RG-11/U shall be shielded which provides a minimum of 95 percent coverage, with a stranded copper center conductor of a minimum 14 AWG, polyethylene insulation, and black non-conductive polyvinylchloride (PVC) jacket.

5. All runs greater than 2750 feet will be substituted with a fiber optic cable. If using fiber optics as a signal carrier then the following equipment will be utilized:

   a. Multimode fiber optic cable a minimum size of 62 microns

   b. Video transmitter, installed at the camera that utilizes 12 VDC or 24 VAC for power.

c. Video receiver, installed at the switcher.

6. RG-59/U Technical Characteristics

AWG	22
Stranding	7x29
Conductor Diameter	.031 in.
Conductor Material	BCC
Insulation Material	Gas-injected FHDPE
Insulation Diameter	.145 in.
Outer Shield Type	Braid/Braid
Outer Jacket Material	PVC
Overall Nominal Diameter	.242 in.
UL Temperature Rating	75°C
Nom. Characteristic Impedance	75 Ohms
Nom. Inductance	0.094 µH/ft
Nom. Capacitance	Conductor to Shield 17.0 pF/ft
Nom. Velocity of Propagation	80 %
Nom. Delay	1.3 ns/ft
Nom. Conductor DC Resistance @ 20°C	12.2 Ohms/1000 ft
Nom. Outer Shield DC Resistance @ 20°C	2.4 Ohms/1000 ft
Max. Operating Voltage	UL 300 V RMS

7. RG-6/U Technical Characteristics:

AWG	18
Stranding	7x27
Conductor Diameter	.040 in.
Conductor Material	BC
Insulation Material	Gas-injected FHDPE
Insulation Diameter	.180 in.
Outer Shield Material	Trade Name Duofoil
Outer Shield Type	Tape/Braid
Outer Shield %Coverage	100 %
Outer Jacket Material	PVC
Overall Nominal Diameter	.274 in.

Nom. Characteristic Impedance	75 Ohms
Nom. Inductance	0.106 µH/ft
Nom. Capacitance	Conductor to Shield 16.2 pF/ft
Nom. Velocity of Propagation	82 %
Nom. Delay	1.24 ns/ft
Nom. Conductor DC Resistance	6.4 Ohms/1000 ft
Nominal Outer Shield DC Resistance @ 20°C	2.8 Ohms/1000 ft
Max. Operating Voltage	UL 300 V RMS

8. RG-11/U Technical Characteristics:

AWG	15
Stranding	19x27
Conductor Diameter	.064 in.
Conductor Material	BC
Insulation Material	Gas-injected FHDPE
Insulation Diameter	.312 in.
Inner Shield Type	Braid
Inner Shield Material	BC - Bare Copper
Inner Shield %Coverage	95 %
Inner Jacket Material	PE – Polyethylene
Inner Jacket Diameter	.391 in.
Outer Shield Type	Braid
Outer Shield Material	BC - Bare Copper
Outer Shield %Coverage	95 %
Outer Jacket Material	Trade Name Belflex
Outer Jacket Material	PVC Blend
Overall Nominal Diameter	.520 in.
Operating Temperature Range	-35°C To +75°C
Non-UL Temperature Rating	75°C
Nom. Characteristic Impedance	75 Ohms
Nom. Inductance	0.097 µH/ft
Nom. Capacitance	Conductor to Shield 17.3 pF/ft
Nom. Velocity of Propagation	78 %
Nom. Delay	1.30 ns/ft

Nom. Conductor DC Resistance	3.1 Ohms/1000 ft
Nom. Inner Shield DC Resistance	1.8 Ohms/1000 ft
Nom. Outer Shield DC Resistance	1.4 Ohms/1000 ft
Max. Operating Voltage Non-UL	300 V RMS

9. Signal Cables:

   a. Signal wiring for PoE cameras depends on the distance the camera is being installed from either a hub or the server.

   b. If the camera is up to 300 ft from a hub or the server, then use a shielded UTP category 5 (CAT-V) cable a with standard RJ-45 connector at each end. The cable with comply with the Power over Ethernet, IEEE802.3af, Standard.

   c. If the camera is over 300 ft from a hub or server then utilize a multimode fiber optic cable with a minimum size of 62 microns.

   d. Provide a separate cable for power.

   e. CAT-5 Technical Characteristics:

Number of Pairs	4
Total Number of Conductors	8
AWG	24
Stranding	Solid
Conductor Material	BC - Bare Copper
Insulation Material	PO – Polyolefin
Overall Nominal Diameter	.230 in.
IEC Specification	11801 Category 5
TIA/EIA Specification	568-B.2 Category 5e
Max. Capacitance Unbalance	(pF/100 m) 150 pF/100 m
Nom. Velocity of Propagation	70 %
Max. Delay	(ns/100 m) 538 @ 100MHz
Max. Delay Skew	(ns/100m) 45 ns/100 m
Max. Conductor DC Resistance	9.38 Ohms/100
Max. DCR Unbalance@ 20°C	3 %
Max. Operating Voltage	UL 300 V RMS

10. Fiber Optic Cables Technical Characteristics:

Fiber Type	62.5 Micron
Number of Fibers	4
Core Diameter 6	2.5 +/- 2.5 microns

Core Non-Circularity	5% Maximum
Clad Diameter	125 +/- 2 microns
Clad Non-Circularity	1% Maximum
Core-clad Offset	1.5 Microns Maximum
Primary Coating Material	Acrylate
Primary Coating Diameter	245 +/- 10 microns
Secondary Coating Material	Engineering Thermoplastic
Secondary Coating Diameter	900 +/- 50 microns
Strength Member Material	Aramid Yarn
Outer Jacket Material	PVC
Outer Jacket Color	Orange
Overall Diameter	.200 in.
Numerical Aperture	.275
Maximum Gigabit Ethernet	300 meters
Maximum Gigabit Ethernet	550 meters

11. Power Cables
   a. Will be sized accordingly and shall comply with the NEC. High voltage power cables will be a minimum of three conductors, 14 AWG, stranded, and coated with a non-conductive polyvinylchloride (PVC) jacket. Low voltage cables will be a minimum of 18 AWG, stranded and non-conductive polyvinylchloride (PVC) jacket.
   b. Will be utilized for all components of the VASS System that require either a 110 VAC 60 Hz or 220 VAC 50 Hz input. Each feed will be connected to a dedicated circuit breaker at a power panel that is primarily for the security system.
   c. All equipment connected to AC power shall be protected from surges. Equipment protection shall withstand surge test waveforms described in IEEE C62.41. Fuses shall not be used as a means of surge protection.
   d. Shall be rated for either 110 or 220 VAC, 50 or 60 Hz, and shall comply with VA Master Spec 26 05 21 Low Voltage Electrical Power Conductors and Cables (600 Volts and Below).
   e. Low Voltage Power Cables
      1) Shall be a minimum of 18 AWG, Stranded and have a polyvinylchloride outer jacket.

2) Cable size shall determined using a basic voltage over
distance calculation and shall comply with the NEC's
requirements for low voltage cables.

PART 3 - EXECUTION
3.1. GENERAL

A. Installation: The Contractor shall install all system components
including Owner furnished equipment, and appurtenances in accordance
with the manufacturer's instructions, ANSI C2 and as shown, and shall
furnish all necessary connectors, terminators, interconnections,
services, and adjustments required for a complete and operable data
transmission system.

B. Identification and Labeling: The Contractor shall supply permanent
identification labels for each cable at each end that will appear on
the as-built drawings. The labeling format shall be identified and a
complete record shall be provided to the Owner with the final
documentation. Each cable shall be identified by type or signal being
carried and termination points. The labels shall be printed on letter
size label sheets that are self laminated vinyl that can be printed
from a computer data base or spread sheet. The labels shall be E-Z
code WES12112 or equivalent.

1. The Contractor shall provide all personnel, equipment,
instrumentation, and supplies necessary to perform all testing.

C. Transient Voltage Surge Suppressors (TVSS): The Contractor shall mount
TVSS within 3 m (118 in) of equipment to be protected inside terminal
cabinets or suitable NEMA 1 enclosures. Terminate off-premise
conductors on input side of device. Connect the output side of the
device to the equipment to be protected. Connect ground lug to a low
impedance earth ground (less than 10 ohms) via Number 12 AWG insulated,
stranded copper conductor.

D. Contractor's Field Test: The Contractor shall verify the complete
operation of the data transmission system during the Contractor's Field
Testing. Field test shall include a bit error rate test. The
Contractor shall perform the test by sending a minimum of 1,000,000
bits of data on each DTM circuit and measuring the bit error rate. The
bit error rate shall not be greater than one (1) bit out of each
100,000 bits sent for each dial-up DTM circuit, and one (1) bit out of

1,000,000 bits sent for each leased or private DTM circuit. The
Contractor shall submit a report containing results of the field test.

E. Acceptance Test and Endurance Test: The wire line data transmission
system shall be tested as a part of the completed IDS and EECS during
the Acceptance test and Endurance Test as specified.

F. Identification and Labeling: The Contractor shall supply
identification tags or labels for each cable. Cable shall be labeled
at both end points and at intermediate hand holes, manholes, and
junction boxes. The labeling format shall be identified and a complete
record shall be provided to the Owner with the final documentation.
Each cable shall be identified with type of signal being carried and
termination points.

3.2 INSTALLATION

> SPEC WRITER NOTE: Delete and/or amend
> this all paragraphs and sub-paragraphs to
> apply to only the equipment and devices
> that are being installed.

A. System installation shall be in accordance with NECA 303, manufacturer
and related documents and references, for each type of security
subsystem designed, engineered and installed.

B. Components shall be configured with appropriate "service points" to
pinpoint system trouble in less than 30 minutes.

C. The Contractor shall install all system components including Government
furnished equipment, and appurtenances in accordance with the
manufacturer's instructions, documentation listed in Sections 1.5 of
this document, and shall furnish all necessary connectors, terminators,
interconnections, services, and adjustments required for a complete and
operable system.

D. The VASS System will be designed, engineered, installed, and tested to
ensure all components are fully compatible as a system and can be
integrated with all associated security subsystems, whether the system
is a stand alone or a complete network.

E. For integration purposes, the VASS System shall be integrated where
appropriate with the following associated security subsystems:

1. PACS:

a. Provide 24 hour coverage of all entry points to the perimeter and
agency buildings, as well as all emergency exits utilizing a
fixed color camera.

   b. Record cameras on a 24 hours basis.

   c. Be programmed go into an alarm state when an emergency exit is opened, and notify the Physical Access Control System and Database Management of an alarm event.

  2. IDS:

   a. Provide a recorded alarm event via a color camera that is connected to the IDS system by either direct hardwire or a security system computer network.

   b. Record cameras on a 24 hours basis.

   c. Be programmed to go into an alarm state when an IDS device is put into an alarm state, and notify the PACS.

   d. For additional VASS System requirements as they relate to the IDS, refer to Section 28 16 00 "INTRUSION DETECTION".

  3. Security Access Detection:

   a. Provide full coverage of all vehicle and lobby entrance screening areas utilizing a fixed color camera.

   b. Record cameras on a 24 hours basis.

> SPEC WRITER NOTE: Delete subparagraph below if not required for the project. Coordinate with Part 2.

   c. The VASS System should have facial recognition software to assist in identifying individuals for current and future purposes.

  4. EPPS:

   a. Provide a recorded alarm event via a color camera that is connected to the EPPS system by either direct hardwire or a security system computer network.

   b. Record cameras on a 24 hours basis.

   c. Be programmed to go into an alarm state when an emergency call box or duress alarm/panic device is activated, and notify the Physical Access Control System and Database Management of an alarm event.

F. Integration with these security subsystems shall be achieved by computer programming or the direct hardwiring of the systems.

G. For programming purposes refer to the manufacturers requirements for correct system operations. Ensure computers being utilized for system integration meet or exceed the minimum system requirements outlined on the systems software packages.

H. A complete VASS System shall be comprised of, but not limited to, the following components:

1. Cameras
2. Lenses
3. Video Display Equipment
4. Camera Housings and Mounts
5. Controlling Equipment
6. Recording Devices
7. Wiring and Cables

I. The Contractor shall visit the site and verify that site conditions are in agreement/compliance with the design package. The Contractor shall report all changes to the site or conditions that will affect performance of the system to the Contracting Officer in the form of a report. The Contractor shall not take any corrective action without written permission received from the Contracting Officer.

J. Existing Equipment

1. The Contractor shall connect to and utilize existing video equipment, video and control signal transmission lines, and devices as outlined in the design package. Video equipment and signal lines that are usable in their original configuration without modification may be reused with Contracting Officer approval.

2. The Contractor shall perform a field survey, including testing and inspection of all existing video equipment and signal lines intended to be incorporated into the VASS System, and furnish a report to the Contracting Officer as part of the site survey report. For those items considered nonfunctioning, provide (with the report) specification sheets, or written functional requirements to support the findings and the estimated cost to correct the deficiency. As part of the report, the Contractor shall include a schedule for connection to all existing equipment.

3. The Contractor shall make written requests and obtain approval prior to disconnecting any signal lines and equipment, and creating equipment downtime. Such work shall proceed only after receiving Contracting Officer approval of these requests. If any device fails after the Contractor has commenced work on that device, signal or control line, the Contractor shall diagnose the failure and perform any necessary corrections to the equipment.

4. The Contractor shall be held responsible for repair costs due to Contractor negligence, abuse, or incorrect installation of equipment.

5. The Contracting Officer shall be provided a full list of all equipment that is to be removed or replaced by the Contractor, to include description and serial/manufacturer numbers where possible. The Contractor shall dispose of all equipment that has been removed or replaced based upon approval of the Contracting Officer after reviewing the equipment removal list. In all areas where equipment is removed or replaced the Contractor shall repair those areas to match the current existing conditions.

K. Enclosure Penetrations: All enclosure penetrations shall be from the bottom of the enclosure unless the system design requires penetrations from other directions. Penetrations of interior enclosures involving transitions of conduit from interior to exterior, and all penetrations on exterior enclosures shall be sealed with rubber silicone sealant to preclude the entry of water and will comply with VA Master Specification 07 84 00, Firestopping. The conduit riser shall terminate in a hot-dipped galvanized metal cable terminator. The terminator shall be filled with an approved sealant as recommended by the cable manufacturer and in such a manner that the cable is not damaged.

L. Cold Galvanizing: All field welds and brazing on factory galvanized boxes, enclosures, and conduits shall be coated with a cold galvanized paint containing at least 95 percent zinc by weight.

M. Interconnection of Console Video Equipment: The Contractor shall connect signal paths between video equipment as specified by the OEM. Cables shall be as short as practicable for each signal path without causing strain at the connectors. Rack mounted equipment on slide mounts shall have cables of sufficient length to allow full extension of the slide rails from the rack.

N. Cameras:
1. Install the cameras with the focal length lens as indicated for each zone.
2. Connect power and signal lines to the camera.
3. Aim camera to give field of view as needed to cover the alarm zone.
4. Aim fixed mounted cameras installed outdoors facing the rising or setting sun sufficiently below the horizon to preclude the camera looking directly at the sun.
5. Focus the lens to give a sharp picture (to include checking for day and night focus and image quality) over the entire field of view

      6. Synchronize all cameras so the picture does not roll on the monitor when cameras are selected.

      7. PTZ cameras shall have all preset positions and privacy areas defined and programmed.

O. Monitors:

      1. Install the monitors as shown and specified in design and construction documents.

      2. Connect all signal inputs and outputs as shown and specified.

      3. Terminate video input signals as required.

      4. Connect the monitor to AC power.

P. Switcher:

      1. Install the switcher as shown in the design and construction documents, and according to the OEM.

      2. Connect all subassemblies as specified by the manufacturer and as shown.

      3. Connect video signal inputs and outputs as shown and specified; terminate video inputs as required.

      4. Connect alarm signal inputs and outputs as shown and specified; connect control signal inputs and outputs for ancillary equipment or secondary control/monitoring sites as specified by the manufacturer and as shown.

      5. Connect the switcher CPU and switcher subassemblies to AC power.

      6. Load all software as specified and required for an operational VASS System configured for the site and building requirements, including data bases, operational parameters, and system, command, and application programs.

      7. Provide the original and 2 backup copies for all accepted software upon successful completion of the endurance test.

      8. Program the video annotation for each camera.

Q. Video Encoder/Decoder

      1. Install the Video Encoder/Decoder per design and construction documents, and as specified by the OEM.

      2. Connect analog camera inputs to video encoder.

      3. Connect network camera to video decoder.

      4. Connect video encoder to VASS network.

      5. Connect video decoder to video matrix, DVR, monitor etc.

      6. Connect unit to AC power (UPS).

       7. Configure the video encoder/decoder per manufacturer's recommendation and project requirements.

R. Video Server:

       1. Install the video server per design and construction documents, and as specified by the OEM.

       2. Connect video server to AC power (UPS).

       3. Connect to VASS network.

       4. Install operating system and Video Management Software.

       5. Provide Video Management Software programming per VA guidance and the requirements provided by the Owner. Programming shall include:

          a. Camera names

          b. Screen views

          c. Camera recording schedules (continuous and event) driven recording. Events include alarms from other systems (sensors), manual input, and video motion detection.

          d. Video detection zones for each camera requiring video motion detection

          e. Alarm interface

          f. Alarm outputs

          g. GUI maps, views, icons and actions

          h. PTZ controls (presets, time schedules for privacy zones etc.)

          i. Reports

S. Video Workstation:

       1. Install the video workstation per design and construction documents, and as specified by the OEM.

       2. Connect video workstation to AC power (UPS).

       3. Connect to VASS network.

       4. Install operating system and application software.

       5. Provide application software programming per VA guidance and the requirements provided by the Owner. Programming shall include:

          a. Screen views

          b. Graphical User Interface (GUI) maps, views, icons and actions

          c. Alarm outputs

          d. Reports

T. Network Switch:

       1. Install the network switch per design and construction documents, and as specified by the OEM.

       2. Connect network switch to AC power (UPS).

3. Connect network cameras to network switch.

4. Configure the network switch per manufacturer's recommendation and project requirements.

U. Network Recording Equipment

1. Install the NVR or video storage unit as shown in the design and construction documents, and as specified by the OEM.

2. Connect recording device to AC power (UPS).

3. Connect recording device to network switch as shown and specified.

4. Configure network connections

> SPEC WRITER NOTE: Depending of VASS configuration recording schedules may be provided through Video Management Software. Edit subparagraphs below as appropriate for the project.

5. Provide recording unit programming per VA guidance and the requirements provided by the Owner. Programming shall include:

a. Camera names

b. Screen views

c. Camera recording schedules (continuous and event) driven recording. Events include alarms from other systems (sensors), manual input, and video motion detection.

d. Video detection zones for each camera requiring video motion detection

e. Alarm interface

f. Alarm outputs

g. GUI maps, views, icons and actions

h. PTZ controls (presets, time schedules for privacy zones etc.)

i. Reports

V. Video Recording Equipment:

1. Install the video recording equipment as shown in the design and construction documents, and as specified by the OEM.

2. Connect video signal inputs and outputs as shown and specified.

3. Connect alarm signal inputs and outputs as shown and specified.

4. Connect video recording equipment to AC power.

5. Program the video recording equipment;

a. Recording schedules

b. Camera caption

W. Video Signal Equipment:

1. Install the video signal equipment as shown in the design and construction documents, and as specified by the OEM.

2. Connect video or signal inputs and outputs as shown and specified.

3. Terminate video inputs as required.

4. Connect alarm signal inputs and outputs as required.

5. Connect control signal inputs and outputs as required

6. Connect electrically powered equipment to AC power.

X. Camera Housings, Mounts, and Poles:

1. Install the camera housings and mounts as specified by the manufacturer and as shown, provide mounting hardware sized appropriately to secure each camera, housing and mount with maximum wind and ice loading encountered at the site.

2. Provide a foundation for each camera pole as specified and shown.

3. Provide a ground rod for each camera pole and connect the camera pole to the ground rod as specified in Division 26 of the VA Master Specification and the VA Electrical Manual 730.

4. Provide electrical and signal transmission cabling to the mount location via a hardened carrier system from the Physical Access Control System and Database Management to the device.

5. Connect signal lines and AC power to the housing interfaces.

6. Connect pole wiring harness to camera.

3.3 SYSTEM START-UP

A. The Contractor shall not apply power to the VASS System until the following items have been completed:

1. VASS System equipment items and have been set up in accordance with manufacturer's instructions.

2. A visual inspection of the VASS System has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.

3. System wiring has been tested and verified as correctly connected as indicated.

4. All system grounding and transient protection systems have been verified as installed and connected as indicated.

5. Power supplies to be connected to the VASS System have been verified as the correct voltage, phasing, and frequency as indicated.

B. The Commissioning Agent will observe startup and contractor testing of selected equipment. Coordinate the startup and contractor testing schedules with the Resident Engineer and Commissioning Agent. Provide a minimum of 7 days prior notice.

C. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installation, defective equipment items, or collateral damage as a result of Contractor work efforts.

3.4 SUPLEMENTAL CONTRACTOR QUIALITY CONTROL

A. The Contractor shall provide the services of technical representatives who are familiar with all components and installation procedures of the installed VASS System; and are approved by the Contracting Officer.

B. The Contractor will be present on the job site during the preparatory and initial phases of quality control to provide technical assistance.

C. The Contractor shall also be available on an as needed basis to provide assistance with follow-up phases of quality control.

D. The Contractor shall participate in the testing and validation of the system and shall provide certification that the system installed is fully operational as all construction document requirements have been fulfilled.

3.5 COMMISSIONING

A. Provide commissioning documentation in accordance with the requirements of Section 28 08 00 – COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS for all inspection, start up, and contractor testing required above and required by the System Readiness Checklist provided by the Commissioning Agent.

B. Components provided under this section of the specification will be tested as part of a larger system. Refer to Section 28 08 00 – "COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS" and related sections for contractor responsibilities for system commissioning.

3.6 DEMONSTRATION AND TRAINING

A. All testing and training shall be compliant with the VA General Requirements, Section 01 00 00, "GENERAL REQUIREMENTS".

B. Provide services of manufacturer's technical representative for [four] <insert hours> hours to instruct VA personnel in operation and maintenance of units.

C. Submit training plans and instructor qualifications in accordance with the requirements of Section 28 08 00 – "COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS".

-----END----