

VIDEO SURVEILLANCE SYSTEMS

DOCUMENT NUMBER: 28 23 00

APPLICATION: ELEMENTARY, MIDDLE AND HIGH SCHOOL

DATE OF ISSUE:

- 04-21-14** - **Revised Paragraphs 2.G, 9.G, and 9.L**
- 02-26-14** - **Added infrared light source to IP Camera Requirements**
- 01-11-13 - Miscellaneous revisions
- 12-04-12 - Miscellaneous revisions
- 10-26-11 - Miscellaneous revisions
- 04-21-11 - Revised for compatibility with Owner's standard Video Management System
- 02-08-11 - Revised camera networking to utilize CAT 6 (purple) cabling.
- 01-31-11 - First Issued

NOTES:

Systems are to be designed in accordance with the attached requirements.

Any deviation from these standards requires approval prior to bidding. Deviation/substitution requests from bidders, subsequent approvals by the HCPS Communications & Electronics (C&E) Department, and assignment of static IP addresses by the HCPS CCTV/LAN Department shall be routed through the assigned project coordinator, hereinafter referred to as "Owner."

ATTACHMENTS:

Security Camera System (SCS) Requirements, dated **04-21-14**.....pages 2-9

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1. GENERAL DESIGN CRITERIA

- A. This document provides a general description, functional requirements, characteristics, and criteria for an integrated IP, network based, Security Camera System that will display live and playback recorded digital video streams from multiple IP cameras, simultaneously, on the monitoring station console and on other display and control platforms. This shall include all cameras, software, power supplies, mounting hardware, and all other equipment as required.
- B. The Security Camera System (SCS) will be managed by Video Management System (VMS) software that is compatible with existing enterprise system.
- C. Any substitution or deviation from specified items MUST be fully documented to be considered. Substitutions must be of equal or higher quality than specified. Hillsborough County Public Schools (HCPS) reserves the right to request demonstration of similar equipment to determine whether substitution is equal or better.

2. SYSTEM DESCRIPTION AND FEATURES

- A. System shall be capable of accepting IP or analog cameras and encoders.
- B. Video archival will be provided by video system network storage servers without the need to share or utilize district network servers. (See paragraph 1B.)
- C. Internal drives shall only be used for recording archived video and shall be field replaceable. (See paragraph 1B.)
- D. All equipment will have UPS backup.
- E. All IP based physical security products must be compliant with either Open Network Video Interface Forum (ONVIF) or Physical Security Interoperability Alliance (PSIA) standards.
- F. All equipment shall be listed by UL specifically for the intended use and shall have FCC certification where appropriate. Evidence of compliance shall be supplied upon request.
- G. To allow for diagnostic testing, each camera will be assigned a unique IP address. ~~[Delete requirement: Cameras SHALL NOT be set up on a VLAN.]~~
- H. The VMS shall have the capability to: centrally add, manage and modify user accounts and privileges to one or all servers simultaneously with a single entry and integrate with existing Active Directory or LDAP servers.
- I. VMS shall view all cameras in the system and sort by connection, recording status, IP address, firmware revision.
- J. VMS must have the ability to create maps within maps linked to cameras and servers within HCPS; triggers and alarms can be integrated into and controlled directly from the maps.
- K. VMS must include the option to add a stand-alone client-server monitoring system to monitor and log analog camera video loss, IP camera connection loss,

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hard drive failure, server connection loss and system temperature on all video servers; the health manager can alert the user via email when a change is detected.

- L. VMS must be able to set up automatic email notifications to be sent to one or many users to alert them of events occurring on the client and servers
- M. The VMS must also have the following features:
 - (1). Third-party IP Camera and Access Control integration
 - (2). Audit trail functionality
 - (3). Digital PTZ functionality
 - (4). Mobile Applications
 - (5). Multi-streaming in IP Cameras
 - (6). Thumbnail and time-line search ability

3. IP CAMERA REQUIREMENTS

- A. IP Camera (1MP):
 - (1). 6 mm: Color: 0.1 lux B/W: 0.02 lux
 - (2). 12 mm: Color: 0.15 lux B/W: 0.03 lux
- B. IP Camera (1MP-WDR): Color: 0.5 lux B/W: 0.08 lux
- C. IP Camera (3MP): Color: 0.5 lux B/W: 0.08 lux
- D. IP Camera (5MP): Color: 0.2 lux B/W: 0.04 lux
- E. An infrared (IR) lighting source must be installed if the area to be recorded has no other light source, i.e. motion activated lights, photocell lights (that illuminate automatically at night), or other consistent and reliable ambient lighting source. IR Light Emitting Diodes (LEDs) can provide IR illumination. These can augment the naturally occurring light in the scene and can be mounted anywhere as long as the IR light illuminates the object (or area) that the camera is watching. IR lights can be installed at or near the camera, or scattered throughout, a parking lot for instance, bathing the entire area in IR light.

4. IMAGE SETTINGS:

- A. Cameras shall be equipped with the following adjustable image settings:
 - (1). Compression
 - (2). Color
 - (3). Brightness
 - (4). Sharpness
 - (5). Contrast
 - (6). White balance
 - (7). Exposure control
 - (8). Exposure zones
 - (9). Backlight compensation
 - (10). Low light fine tuning
 - (11). Rotation: (0°, 90°, 180°, 270°)
 - (12). Corridor Format
 - (13). Text and image overlay
 - (14). Privacy mask
 - (15). Image mirroring
 - (16). WDR Cameras:
 - (a). Dynamic contrast
 - (b). Dynamic capture: up to 120 dB (0.5 - 500,000 lux) depending on scene

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5. FEATURES:
- A. Day and night automatically removable infrared-cut filter
 - B. Removable inner camera module with encapsulated electronics (MUST BE ABLE TO REPLACE DEFECTIVE CAMERA MODULE WITHOUT THE NEED TO REMOVE THE CAMERA BASE.)
 - C. SD/SDHC/SDXC slot supporting memory card up to 64 GB
 - D. Support for recording to network share (network-attached storage or file server)
 - E. H.264 Baseline and Main Profile (MPEG-4 Part 10/AVC) Motion JPEG video compression
 - F. Multiple, individually configurable streams in H.264 and Motion JPEG;
 - G. Controllable Frame Rate and Bandwidth
 - H. VBR and CBR H.264
 - I. Digital PTZ, preset positions, guard tour
 - J. Open API for software integration, including the ONVIF (specification available at www.onvif.org)
 - K. Remote zoom, remote focus, and pixel counter
 - L. Video motion detection and active tampering alarm
 - M. Intelligent video, edge storage events with External input
 - N. File upload: FTP, HTTP, network share and email
 - O. Notification: email, HTTP and TCP
 - P. Video recording to edge storage
 - Q. Pre- and post-alarm video buffering
 - R. External output activation, audio recording to edge storage, plays audio clip
 - S. Indoor cameras will be tamper and vandal resistant with IK10 impact-resistant casing and aluminum base
 - T. Audio output connection
 - U. Automatic iris control that adjusts to set the best iris position for optimal depth of field, resolution, image contrast and clarity
 - V. Power over Ethernet
 - W. Operating temperatures from -40 °C to 55 °C (-40 °F to 131 °F)
 - X. Operating humidity from 10 - 100% RH (condensing)
 - Y. IP66- and NEMA 4X-rated, IK10 impact-resistant casing with aluminum base and dehumidifying membrane (for vandal resistant cameras).
 - Z. Terminal block for 1 alarm input and 1 output and 3.5 mm line out
 - AA. Smoked transparent cover and removable weather shield
 - BB. Must include software that can automatically (and remotely) find and configure cameras, set IP addresses, show connection status, and manage firmware upgrades for multiple devices.
6. ADDITIONAL CAMERA QUALIFICATIONS
- A. Manufacturer shall have a minimum of five [5] years of experience in the manufacture and design of Video Surveillance Cameras.
 - B. Cameras shall be of manufacturer's official product line and be designed for continuous 24/7 use in commercial / industrial applications.
 - C. Camera Manufacturer shall provide a 24hr a day, seven days a week, 365 days a year technical support line.
 - D. Cameras are to be provided with appropriate covers and mounting hardware for the intended use and location.
 - E. Cameras intended for outdoor use (including cameras mounted under outdoor ceilings) will be provided with mounting hardware and covers specifically designed for outdoor application.
 - F. All cameras must be listed on the VMS IP Camera Integration List.
 - G. All cameras must support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.

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- H. The camera must contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
- I. Network cameras provided shall be backed by a minimum of three year manufacturer warranty.

7. VMS SERVER REQUIREMENTS

- A. If VMS is to be loaded on a non-exacqVision server, the appliance must meet or exceed the following criteria:
 - (1). Processor: Intel® Core i7-2600 3.4GHz or Xeon E3-1220
 - (2). RAM: 4 GB
 - (3). Hard Drive: RAID5 (Minimum), RAID6 (Preferred), Minimum sustained non-sequential write capacity 70MBps
 - (4). Operating Systems: Microsoft® Windows 7 Pro or Server 2008 (32 or 64 bit) Linux Ubuntu 10.04
 - (5). NIC: 2x 1Gbps (minimum), 4x 1Gbps (preferred)
- B. If installation site can utilize existing analog cameras, a Hybrid Video Server will be required.

8. NETWORK

- A. IP Camera networking will be performed using CAT 6 (Purple), to contrast the camera infrastructure from other forms of data transmission.
- B. Modifications to existing systems shall conform to the requirements of Hillsborough County District Schools Standard *Document 16765 – Computer Network Design Guideline for Existing Systems*.
- C. New construction must conform to Hillsborough County Schools Standard *Document Number 16760 -- Requirements for the Design, Installation and Operation of Computer Networks*.

9. EXECUTION

- A. Installation of the Security Camera System (SCS) shall include the appropriate engineering equipment, labor, materials, apparatus, tools, transportation, temporary construction and special services as required to for a complete working security system installation, as described in these specifications. The installation will be performed by factory trained contractor installer. The contractor will be responsible for all required hardware and software configurations.
 - (1). Vendor shall have design and installation training with certifications of competence, including, but not limited to, employing at least one Building Industry Consulting Service International (“BICSI”) and one Registered Communications Distribution Designer (“RCDD”) on staff for the duration of the agreement and able to provide proof. The RCDD shall be involved with all projects from the start through its completion. If, at any time during this agreement, the vendor does not have an RCDD involved with a project, vendor shall be in default of the agreement.
 - (2). Contractor shall have the following certifications prior to submitting a quotation for surveillance camera projects and must include the appropriate documentation with his bid as proof of successful completion:

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- (a). Vendor must have and provide proof of a current Florida Electrical Contractors License (ES or higher).
 - (b). VMS Certified Reseller
 - (3). All camera installation, configuration, setup, program and related work shall be performed by electronic technicians thoroughly trained and certified by the manufacturer in the installation and service of the equipment provided.
- B. All installed raceway must be terminated with bonding bushings. IMC and Rigid raceways can be terminated with locknuts and bushings, or thread-less compression connectors with bushings. EMT raceways must be terminated with throated compression connectors or compression connectors with bond bushings. It is the vendor / contractors responsibility to check all raceway bond bushings prior to cable installation. Wall penetrations shall be fire caulked, patched and painted to match existing building.
 - C. Raceway entering junction boxes shall be bonded to the junction box with a grounding lug or ground bar suitable for multi-conductor connections.
 - D. A single equipment grounding point for the SCS shall be located in the system control room to the nearest electrical panel via #6 grounding conductor. All J-boxes and wire moldings shall be bonded with approved grounding bushings, per National Electric Code (NEC) and HCPS Specifications.
 - E. All camera video cables shall have surge suppression protection.

NOTE: Patch cord at head end, or CAT 6 cable to IP camera, needs to be longer than the ground wire (switch to ground, ground to Surge Protector...) – CAT 6 (or other cable as appropriate) can be coiled to accomplish this.

- F. All exterior exposed cabling must be concealed in conduit.
- G. All SCS installations require remote access software installations on site. A maximum of three (3) individual desktop computers and their location will be determined by HCPS Planning Coordinator. (remote access shall be established upon completion of IT network drop activation).
- H. Upon pre-inspection, the vendor / contractor must provide an "as built" drawing showing junction box locations and cable routing.
- I. In-line splices shall not be used. All cable runs will be continuous from termination to termination. Terminations shall be made only at devices and where necessary for transitions from indoor to outdoor cable types; transition splices must be in junction boxes. Intermediate terminations for the convenience of "pulling" or other reasons shall not be made. If cables are damaged during construction, they must be removed and new continuous cables installed. Repair splicing is not permitted.

Pathways shall be labeled at all endpoints and at all junction boxes. Additional labeling shall be placed at 50' intervals throughout the length of the pathway. Pathways include all conduits, cable trays, raceways, and junction boxes. Junction boxes shall be painted gold and labeled / stenciled SCS (Security Camera System). All cabling will be labeled at both ends and at junctions, with

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the following: 1) Name and contact information of cable installer, and 2) What the cable is for.

- J. Any debris resulting from vendor's installation of security camera system must be promptly removed and disposed of by the vendor.
- K. Contractor will provide all cabling, installation and training required to furnish and install a complete, operable system. Consultation with various HCPS departments or support personnel (routed through the assigned project coordinator) shall include, but is not limited to, the following:
 - (1). Communications & Electronics Dept.
 - (2). CCTV/LAN Dept.
 - (3). Information Services Dept.
 - (4). Planning & Construction Dept.
 - (5). Maintenance Dept. Electricians
- L. Contractor must contact Owner to request IP addresses for cameras, servers and other applicable hardware. **This will be accomplished after initial walkthrough, by providing a design drawing indicating camera locations, type and PoE class. CCTV/LAN Dept. will then determine the proper Intermediate Distribution Frame (IDF), by room number, switch number and port number available for use.** Upon receipt of IP addresses, Contractor shall furnish a list that includes: site name, manufacturer, type, and model number of hardware, location of hardware (with room numbers), MAC address, serial number, also switch and port number used.
- M. Contractor shall enable the web server, allowing remote access through web-based client.

10. EQUIPMENT INSTALLATION

- A. Code Compliance & Permitting
 - (1). These standards contain only partial installation guides for clarification. See the current Florida Building Code and the National Electric Code for any applicable design criteria and / or installation requirements. It is the installers' responsibility to install a system that is code compliant.
 - (2). Some additions to power circuits and penetrations of firewalls or external walls may require review and or permitting by the District's Building Code Manager. There is no charge for this review or permitting but it is the installer's responsibility to obtain this determination and meet requirements for permitting.
- B. As part of the installation, the contractor shall provide the following:
 - (1). Two complete user guides including warranty / guarantee information, contact information for maintenance and repairs, as built drawings and replacement parts listing. Manuals are to be either bound in a three ring binder or other hard cover book.
 - (2). System documentation
 - (3). Site preparation
 - (4). System screen layout and design formats

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- (5). Database design / configuration
 - (6). Data input for initial system configuration
 - (7). Clearly defined, project-specific system acceptance criteria
 - (8). Appropriate status reporting and attendance at all project meetings
 - (9). Formal transmittal of specific project documentation and as-built drawings to Owner
 - (10). Complete hardware set-up of all system stations, peripherals and installation of field hardware
 - (11). Set-up of specific network software configuration requirements
 - (12). Screen Format installation and verification
 - (13). Complete system diagnostics verification
 - (14). Complete system operation verification
 - (15). Perform problem reporting and tracking
 - (16). Prepare project specific installation log
 - (17). Participate in acceptance testing by the Engineer
 - (18). Submit project specific installation documentation to HCPS
 - (19). Contractor shall provide and install a monitor for use with the video server.
 - (20). Contractor will provide and install signage (see below) at all entry exit points:



11. SYSTEM ACCEPTANCE TESTING

- A. A phased acceptance test and performance demonstration program shall be developed and documented by the contractor under the direction of the project coordinator / engineer. These requirements shall apply to all system components and software, including, but not limited to, all system host computers and access control system / SCS interface capability.
- B. The contractor shall perform these tests and document the results under the supervision and witnessing of the project coordinator / engineer. Operational scenarios shall be developed and used by the contractor to simulate the actual use of the system in the normal environment of HCPS facilities.

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- C. Discrepancies found during testing shall be documented by the contractor and maintained in a file with copies provided to the project coordinator / engineer and HCPS. The contractor shall correct any deficiencies or problems found during these tests at no additional cost to HCPS. The problems identified in each phase shall be corrected and the full test completed again without problems before any subsequent testing phase is performed.
 - D. Inspections and tests, or waiving of either, by the HCPS Engineer, shall not relieve the contractor of responsibility for providing hardware, software and documentation strictly in accordance with the specifications. Also, successful completion of testing does not constitute final acceptance of the systems.
12. SYSTEM START UP
- The contractor shall accept full responsibility for the initial application of power to the equipment and the initiation of its operation. The contractor shall also be responsible for running all initial SCS systems and component diagnostics and programs required to provide a complete working system.