SECTION 28 23 00 - VIDEO SURVEILLANCE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. The Surveillance System shall utilize IP-based fixed focus cameras to monitor the internal and external areas of the facility. The activity shall be recorded onto network video recorders (NVR)s which will be connected into the Owner's network. Additionally, the video shall be available on the network for the Owner to access and utilize. Viewing and/or control shall occur by means of a software client loaded onto assigned PC's. Viewing only shall be capable by means of a web based interface, and/or by means of smartphones and tablets utilizing both Apple iOS and/or Android operating systems.

B. The system shall integrate into the Access Control, Intrusion Detection and entry Intercom Systems.

C. The system shall be compatible with the Owner's existing PremiSys, by Identicard, Access Control System.

D. The system shall be an extension of the District's exacqVision system.

1.2 SECTION INCLUDES

A. Cameras

B. Network Video Recorder Software

C. Network Video Recorder Server

D. KVM and monitor

E. UPS

1.3 RELATED SECTIONS

A. Division 1 – General Requirements

B. Section 27 05 00 – Communications Common Work Results

C. Section 27 05 24 – Firestopping

D. Section 27 05 26 – Technology Grounding System

E. Section 27 05 28 – Pathways for Communications Systems

F. Section 28 13 00 – Access Control System

G. Section 28 15 00 – Intrusion Detection System

1.4 DESCRIPTION

A. The Contractor shall furnish and install all labor, equipment, accessories and materials required for the installation of a comprehensive Video Surveillance System in strict compliance with these specifications and as shown on all applicable contract drawings.

B. Any material and/or equipment necessary for the proper operation of the system not specified or described herein shall be deemed part of this specification.

C. The requirements of the conditions of the Contract titled “Supplementary Conditions” and “General Requirements” shall apply to the work as specified in this section. The complete installation shall conform to the requirements set forth by the NEC, all State and Local Building Codes, as required by the “Authority Having Jurisdiction” and the requirements of the Owner.

D. The equipment vendor shall provide the services of a Factory Trained Technician to supervise and make final system adjustments. This Technician, in the presence of the Owner’s representative shall test the system in its entirety.

PART 2 - PRODUCTS

2.1 DESCRIPTION OF SYSTEM

A. The system shall be able to integrate with the District’s existing PremiSys, by Identicard, Access Control system.

B. The system shall be a complete IP based video surveillance system that shall utilize the Owner’s network as the method of transport to a video surveillance server that shall record and retain the video and provide an export capability to transfer files that the Owner wishes to record to an optical media.

C. Indoor, Fixed Focus Cameras
   1. The Camera shall utilize Internet Protocol as the transport for the video signaling.
   2. The Camera shall have the following certifications and approvals:
      a. Safety: EN 60950 (CE), UL 60950-1,CAN/CSA E 60950-1
      b. Immunity: EN 55024IT equipment (CE)
      c. Emission: EN 55022 Class B (CE), EN 62000-3-2 (CE), EN 61000-3-3 (CE), FCC CFR 47 Part 15, Class B
   3. The Camera shall meet or exceed the following performance requirements and criteria:
      a. Image Sensor: 1/3” progressive scan CMOS
      b. Lens: Varifocal 3.0 – 10.5 mm/F1.4 minimum
      c. Horizontal Angle of View: 92° - 34°
      d. Sensitivity: 0.03 lux maximum lower threshhold
      e. Compression: MJPEG, H.264
      f. Resolution:1920 x 1080 (4.0 Megapixel, minimum)
      g. IR Illumination: Yes
      h. Analytics: Motion Detection
      i. Network: IPv4/IPv6, QoS
      j. PoE: 802.3af/at
      k. Vandal Resistant: Yes, IP52
   4. Acceptable Manufacturers and Models shall be
      a. Axis M3086-V
      b. Equivalent Products by Samsung (Hanwha) or Vivotek

5. Provide enclosures and appropriate mounting bracket for each camera provided based on the location and environment of the installation location.

D. Indoor, 360 degree Cameras
1. The Camera shall utilize Internet Protocol as the transport for the video signaling.
2. The Camera shall have the following certifications and approvals:
   a. Safety: EN 60950 (CE), UL 60950-1,CAN/CSA E 60950-1
   b. Immunity: EN 55024IT equipment (CE)
   c. Emission: EN 55022 Class B (CE), EN 62000-3-2 (CE), EN 61000-3-3 (CE), FCC CFR 47 Part 15, Class B
3. The Camera shall meet or exceed the following performance requirements and criteria:
   a. Image Sensor: 4 x 1/2.8" progressive scan CMOS
   b. Lens: Varifocal 3.0 – 6.0 mm
   c. Horizontal Angle of View: 96° - 49°
   d. Sensitivity: 0.17 lux maximum lower threshold
   e. Compression: MJPEG, H.264
   f. Resolution: 4 x 1920 x 1080 (6.0 Megapixel, minimum)
   g. IR Illumination: Yes
   h. Analytics: Motion Detection
   i. Network: IPv4/IPv6, QoS
   j. PoE: 802.3at
   k. Vandal Resistant: Yes, IP52
4. Acceptable Manufacturers and Models shall be
   a. Axis M3067-P
   b. Equivalent Products by Samsung (Hanwha) or Vivotek
5. Provide enclosures and appropriate mounting bracket for each camera provided based on the location and environment of the installation location.

E. Outdoor, 180 Cameras
1. Acceptable Manufacturers and Models shall be
   a. Axis P3807-PVE
   b. Equivalent Products by Samsung (Hanwha) or Vivotek
2. Provide enclosures and appropriate mounting bracket for each camera provided based on the location and environment of the installation location

F. Outdoor, 360 Cameras
1. The Camera shall utilize Internet Protocol as the transport for the video signaling.
2. The Camera shall have the following certifications and approvals:
   a. Safety: EN 60950 (CE)
UL 60950-1
CAN/CSA E 60950-1
   b. Immunity: EN 55024IT equipment (CE)
   c. Emission: EN 55022 Class B (CE)
EN 62000-3-2 (CE)
EN 61000-3-3 (CE)
FCC CFR 47 Part 15, Class B
3. The Camera shall meet or exceed the following performance requirements and criteria:
   a. Image Sensor:4x1/2.8" progressive scan CMOS
   b. Lens: Varifocal 3 – 6 mm/F1.8-2.6 minimum
   c. Horizontal Angle of View:96° - 49°

d. Day/night: Automatic
e. Sensitivity: 0.03 lux maximum lower threshhold
f. Compression: MJPEG, H.264
g. Resolution: 4x1920 x 1080 (8.0 Megapixel, minimum)
h. Frame Rate (Color): 25/ 30 fps
i. Analytics: Motion Detection
j. Network: IPv4/IPv6, QoS
k. PoE: 802.3af
l. Vandal Resistant: Yes
m. WDR: Yes
n. IR: Yes
o. Digital PTZ: Yes

4. Acceptable Manufacturers and Models shall be
   a. Axis P3727-PLE
   b. Equivalent Products by Samsung (Hanwha) or Vivotek
5. Provide enclosures and appropriate mounting bracket for each camera provided based on the location and environment of the installation location

G. Network Video Recording Software (VMS)
1. The VMS shall be compatible with both Windows and Linux operating systems.
2. The VMS shall be compatible with Owner's existing PremiSys, by Identicard, Access Control System
3. The VMS shall provide free client software capable of operating on Windows, Linux or Mac
4. The VMS shall support the following browsers:
   a. Internet Explorer
   b. Google Chrome
   c. Apple Safari
   d. Mozilla Firefox
5. The VMS shall support a minimum of 64 cameras per server with virtually unlimited camera quantities when servers are clustered into an enterprise solution.
6. The VMS client shall support of minimum of 512 server connections per client on a thick client and 16 servers per client on a web client.
7. The VMS shall provide the following operational features:
   a. Bandwidth Throttling
   b. Pre-Post Alarm Recording
   c. Fish-Eye/Panoramic Lens Support
   d. iSCSI Support
   e. Time-Lapse Recording
   f. Client Joystick Configuration
   g. Soft Triggers
   h. Audit Trails
   i. Custom User Groups
   j. 3rd Party Integrations
8. The VMS shall provide the following live view features:
   a. PTZ Control and Presets
   b. Digital PTZ Control and Presets
   c. Multi-Monitor Support
   d. Video Wall Support
   e. Video Aspect Ratios of both 16:9 and 4:3
   f. Event Linking

g. Event Driven Video Switching
h. Time Based Video Switching
i. Camera Groups
j. Event Notifications
k. Facility Mapping

9. The VMS shall provide the following search, playback, export and archive capabilities:
   a. Multi-camera playback
   b. Simultaneous Video Export for a minimum of 16 channels
   c. Graphical Timeline Search
   d. Thumbnail Search
   e. Event Search
   f. Background Quick Export
10. The VMS shall support the recording, viewing, archiving and configuring of at least the following camera manufacturers:
    a. Axis
    b. Samsung (Hanwha)
    c. Vivotek
11. The VMS shall support MJPEG and H.264 video compression formats at a minimum.
12. The VMS shall support unlimited number of configurable camera groups.
13. The VMS shall support maintenance free, transparent archiving to network or local drives. Archiving shall be configurable on a per camera basis to multiple drive locations.
14. The VMS shall support multiple instances per day, with no down-time during transfer of video to archiving.
15. The VMS shall support two-way audio from camera's microphone inputs to video client, and from client to camera's speaker output.
16. The VMS shall support multiple-channel audio recording.
17. The VMS shall provide multiple format video export, including, but not limited to still image JPEG, audio included AVI with preamble displaying all event details and user comments, and multi-camera, audio included secure video database for court evidence.
18. The VMS shall support multiple networks for increased security and bandwidth management.
19. The VMS shall include open API's and any required software and programming required for integration with physical security systems to provide a unified and singular user interface.
20. The VMS shall support access for PDA's and cellphones with proper authentication.
21. The VMS shall provide the capability to configure, view and review cameras from multiple networked recorders at multiple sites on a single interface simultaneously programmed through a process of drag and drop selection, as well as archive to an optical or solid state recording device from any recorder to a local workstation.
22. Acceptable Manufacturer and Product shall be:
    a. An extension of the District's ExacqVision system
    b. Provide any/all licensing for all cameras indicated.
    c. Provide licensed hard clients for 10 users.

H. Network Video Recorder Hardware (NVR)

1. The NVR shall be a rack mounted unit capable of being installed in an EIA standard 19" rack without the use of custom mounting hardware with the exception of commercial, off the shelf, rack mount hardware from the NVR server manufacturer.
2. Each NVR shall be a video optimized NVR server.
3. The NVR hardware shall operate on either the Microsoft Windows 7 or Linux operating systems.

4. Each NVR shall be capable of simultaneously recording, displaying and playing back digitized video from IP cameras and analog cameras through the use of a video encoder. IP Server models shall be capable of being licensed to add IP cameras in increments from one (1) to 64 camera licenses.
5. The NVR shall support recording resolutions from CIF to 20 megapixel (camera dependent) and shall be user selectable. MJPEG, MPEG-4 and H.264 video compression format shall be user selectable depending on the IP camera configured to the IP Server. Video recording shall be available at up to 30 images per second per input channel depending on IP camera type selected.
6. Each NVR shall have a serial port capable of communicating with pan-tilt-zoom (PTZ) cameras.
7. Each NVR shall have two Gbit 1000Base T RJ-45 Ethernet connections for networking to Remote PC clients. Multiple NVR's shall be accessible by multiple clients located anywhere on the network. Each NVR shall record video, audio, and text while displaying live video or playback video. In the event that there is no client actively attached to the NVR, the NVR shall continue to record video and audio, monitor events and all other server functions.
8. Recorded video shall be triggered by the motion detection sensor of the IP camera, an external input device, or in continuous record mode.
9. Each NVR shall have the capability of automatically exporting a predetermined time frame of video to the internal DVD/CD device upon an external trigger input connected to the NVR. Such input shall export to the DVD/CD device a user defined amount of video and video camera source both pre and post event schedulable to the maximum capacity of the DVD/CD media selected.
10. Each NVR shall have the ability to link specific events in an "if-then" scenario. Linked events types shall include video motion, video loss, input trigger, and temperature. Sources of these events shall be any camera connected to the specific server. Action from these events shall include record video, record audio, enable output trigger, output video, notify (send e-mail), and output video to DVD.
11. The NVR hardware shall have an internal DVD/CD device that will allow the server to export video clips to the device in Standalone.Exe (*exe), AVI files (*.avi) and PS files (*ps) formats.
12. The NVR shall be configured with RAID-5 storage consisting of a 4U chassis and eight hot swappable hard drives. The RAID-5 storage shall be internal to the server and shall provide notification of a drive failure to the administrator.
    a. In addition to the previously declared requirements of the NVR. Each NVR shall have a minimum hardware configuration of:
        1) Input Voltage:120/240 VAC auto-sensing
        2) Power Consumption:480 watts
        3) Video Standard:NTSC (30ips) or PAL (25ips)
        4) Recording Resolution:CIF to 20 megapixel (camera dependent)
        5) Compression:MJPEG, MPEG-4 or H.264 by camera or encoder
        6) NIC:2 Gbit 1000Base T RJ-45 (standard), 4 (optional)
        7) USB 2.0 Ports: 8 (8 x USB 2.0)
        8) RAM 8 GB
        9) Hard Drive Storage:4TB, RAID5
        10) Processor (2) QuadCore minimum
        11) HDMI Output
        12) VGA Output:1 DVI-A + 1 DVI-D + 1 Display Port, maximum 2 simultaneous monitors
        13) Keyboard & Mouse:Included
        14) DVD/CD RW: Included, front panel access

15) Operating System: Windows Server 2008 or greater
16) Size: 1RU
17) Operating Temperature: 40° – 95°F (4.5° – 35°C)
18) Relative Humidity: 5 - 95% RH (non-condensing)

b. Acceptable Manufacturer's and Model
1) Servers shall be provided by the VMS manufacturer. The bidder/contractor shall review and modify as recommended by the VMS manufacturer those servers being provided by the VMS manufacturers.
2) Provide NVR's at the following configuration:
a) 1920x1080 camera resolution
b) H.264 compression
c) (5) frames/sec
d) 24 hour by 30% motion
e) (30) day storage
f) Sized for all cameras this project.

I. Keyboard/Video/Mouse (KVM)
1. The unit shall be 1U high and mount in a standard EIA 19" rack mount enclosure or rack.
2. The unit shall be compatible with all current versions of the Microsoft Windows operating system.
3. The unit shall provide inputs compatible with the computers specified for the NVR servers.
4. The unit monitor shall have:
a. Size: 17" diagonal
b. Technology: Industrial Grade Active Matrix TFT LCD
c. Contrast Ratio: 1000:1 (minimum)
d. Brightness: 300 cd/m^2
e. Dot Pitch: .264mm
f. Panel Colors: 16.2 million
g. Viewing Angle: 160º x 160º
h. Video Input: DVI, HDMI
5. Acceptable Manufacturer shall be Dell, IBM or HP.
a. Provide rack mounted shelf for monitor.

J. Uninterruptable Power Supply (UPS)
1. All units whether enclosed in a single housing or utilizing a master slave configuration shall utilize a standard EIA 19" rack mount width and mounting hardware.
2. All units shall be designed for operation on a nominal 120VAC system, with an input range of +/- 20%.
3. All units shall contain a sealed maintenance free, lead acid battery.
4. All units shall provide both local alpha-numeric status display, and accessibility via an RJ-45 connector for remote monitoring and shutdown of the unit. Units shall also contain an audible alarm to be annunciated for all alarm conditions.
5. All units shall be compliant with all applicable UL, cUL and IEC ratings and listings.
6. All units shall have fully on-line double conversion operation.
7. Unless otherwise noted on the Drawings, all units shall be sized for a fifteen minute run time based on the assigned load with a 20% growth factor. Output capacity has been calculated based on the apparent connected load. The Contractor shall verify the actual load prior to bidding based on the Video Surveillance hardware being provided and increase any explicit sizing called for on the drawings based on actual installation conditions at no additional cost to the Owner.

8. All units shall provide an SNMP module and Ethernet interface for remote monitoring and orderly shutdown.
9. Battery capacity shall be provided for a runtime of:
   a. 15 minutes at full load required by this design intent, plus an additional 20% capacity.
10. Acceptable Manufacturers shall be Powerware, APC or Liebert.

PART 3 - EXECUTION

3.1 INSTALLATION

A. VSC is responsible for mounting all exterior mounting brackets and devices (either pole mounted or mounted to the building).

B. Any/All outside components, i.e. power supply, surge suppressers, receiver drivers, shall be mounted in weatherproof boxes (NEMA 3R) with stainless steel or galvanized hardware, unless otherwise accommodated on the inside of the building and fed through to the camera. All penetrations through the building envelope shall be sealed in a weather-tite fashion using a silicon based sealant. Contractor shall coordinate with the General Trades Contractor to ensure all applicable requirements are met.

C. All exterior devices shall be surge protected by means of a UTP surge protector rated to match the performance criteria of the category of cable used and capable of passing 802.3af standard Power over Ethernet, in addition to the data signaling required.

D. Surge protection shall be provided at head end equipment and all remote equipment outside of building. All suppresser grounds shall terminate at closest approved grounding electrodes to provide shortest ground path for surges at roof top mounted cameras.

E. Any structured cabling work required by the Video Surveillance Contractor shall be fully compliant with, and covered under the same warranties as, the structured cabling. As such, the VSC shall coordinate all cabling work with the Electrical Contractor.

F. All low voltage cable (coax/data/power for cameras) shall be isolated from all line voltage equipment.

G. All installations shall be installed in a workmanlike manner.

H. Midspan power injectors shall be utilized for any cameras that must be located outside the range of properly terminated and certified structured cabling distances
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I. All cables (coax, data, fiber and power circuits) shall be identified with proper tagging and labels.

J. VSC shall coordinate location of all cameras with Architect.

K. Initial programming of the Surveillance System shall provide the following operational features:
   1. Remote viewing and reviewing of recorded video by the Administration of the individual school, the District Administration offices and the District Maintenance Offices.
   2. Each user shall be provided an individual viewing screen configuration with the opportunity for the user to reconfigure the screen at their workstation under the supervision of the VSC.

L. Contractor shall provide and program Video Surveillance System to accept Lockdown input from Access Control System.
   1. Contractor shall provide and verify exact Lockdown programming requirements with Owner

M. All rack mounted units shall be spaced at minimum of 1 ¾-inch apart for ventilation purposes as recommended by manufacturer.

N. Perform the following start-up tasks:
   1. Final aim, focus and adjust all cameras. Confirm proper operation of pan-tilt-zoom, heaters, blowers, and other accessories as may be required.
   2. Provide and adjust all lenses as described above. Set shields or filters as necessary.
   3. Program all camera identifiers as directed by the Owner.
   4. Program any/all analytics or other camera specific operational parameters, such as motion triggers, pre-post record times, etc.
   5. Make such other settings and adjustments as required to bring the system on-line and operating in accordance with these Specifications.
   6. Verify on-going and uninterrupted operation of all system components from power supply disruptions, i.e. power failures for any one or more component power sources.

O. Program the graphic command and control module for the operation and features as shown on the Drawings or specified herein. Review desired control operation and schedules with Owner's personnel.

P. Program the single user interface that shall provide the User with access to both the access control system and the video surveillance system.

Q. Refer to the Drawings for equipment quantities, locations, and installation details.

R. VSC shall provide electronic copies of the complete system installation to the SCC. The SCC shall incorporate these into the Operations and Maintenance Manuals to be turned over to the Owner.

3.2 MOUNTING HEIGHTS AND LOCATIONS

A. In all cases, prior to installation, review all camera locations indicated on the Drawings, and adjust locations to avoid any viewing impediments, and optimize the view of each camera, and the camera system as a whole.

3.3 TRAINING

A. The contractor shall provide a minimum of forty (40) hours of instruction to personnel designated by the Owner in the proper use, basic care, and maintenance of the equipment. Such training shall be provided as an integral component of the system.

B. The VSC shall digitally video record the training sessions on standard DVD and provide (2) video copies to the Owner at no additional cost to the Owner.

3.4 WARRANTY

A. VSC shall provide a three (3) year warranty on installation of all Video Surveillance equipment, transmission devices and connections. Any defective material shall be replaced at no expense to the

Owner including labor, shipping or other required expenses to diagnose and repair any system or component failures.

3.5 SUBMITTALS

A. Submittals shall include bound brochures with data sheets for all equipment specified and installation drawings. Drawings shall indicate exact wiring requirements and shall include equipment locations shown on floor plans (1/16” scale, minimum). These drawings shall be dedicated solely to indicate the video surveillance system, components and related wiring.

END OF SECTION 28 23 00

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