

SECTION 28 23 00

VIDEO MANAGEMENT SYSTEM

PART 1. GENERAL

1.01 DESCRIPTION

- A. General Description: This specification section covers the furnishing and installation of a complete expansion to a low-voltage, enterprise-wide video management system (VMS).
- B. Contractor shall coordinate *[and furnish]* licenses and install VMS hardware devices, mounting brackets, power supplies, servers, workstations, recorders, controls, consoles and other components of the system as shown and specified.
- C. Furnish and install special boxes, cable, connectors, wiring, and other accessories necessary to complete the system installation. Requirements shall be in accordance with the Division 26, Electrical Work.
- D. Outlets, junction boxes, pull boxes, conduit, connectors, wiring, and other accessories necessary to complete the system installation, will be provided in accordance with the projects' Division 26, Electrical Work specifications, and coordinated with VMS requirements.
- E. Furnish and install cable, connectors, wiring, and other accessories necessary to complete the system installation. Requirements shall be in accordance with the Division 27, Communications.
- F. General Conditions: Provide the work in accordance with Section 28 05 00, Security System General Requirements.

1.02 QUALIFICATIONS

- A. Provide the work in accordance with Section 28 05 00, Security System General Requirements.

1.03 GENERAL CONDITIONS

- A. In accordance with Section 28 05 00, Security System General Requirements

1.04 RELATED WORK

- A. In accordance with Section 28 05 00, Security System General Requirements

1.05 APPLICABLE PUBLICATIONS

- A. In accordance with Section 28 05 00, Security System General Requirements

1.06 PRECEDENCE

- A. Obtain, read and comply with General Conditions and applicable sub-sections of the contract specifications. Where a discrepancy may exist between any applicable sub-section and directions as contained herein, this section shall govern.

1.07 SHOP DRAWINGS & EQUIPMENT SUBMITTAL

- A. In accordance with Section 28 05 00, Security System General Requirements

1.08 OPERATING AND MAINTENANCE MANUALS

A. In accordance with Section 28 05 00, Security System General Requirements.

1.09 WARRANTY

A. In accordance with Section 28 05 00, Security System General Requirements

1.10 SERVICE AND MAINTENANCE

A. In accordance with Section 28 05 00, Security System General Requirements

1.11 TRAINING

A. In accordance with Section 28 05 00, Security System General Requirements

1.12 OWNER’S RIGHT TO USE EQUIPMENT

A. The Owner reserves the right to use equipment, material and services provided as part of this work prior to Acceptance of the Work, without incurring additional charges and without commencement of the Warranty period.

1.13 TECHNICAL REQUIREMENTS, VIDEO SURVEILLANCE SYSTEM

A. General:

1. The following information is provided to establish required system performance for the complete operating Video Management System (VMS) system expansion to the Denver Public Schools (DPS) system. Some of the performance requirements noted herein are supported and supplied by existing systems in concert with new equipment and software which shall be provided by the Contractor under this scope of work. Contractor shall provide equipment, wiring and software programming at all sites as necessary to provide a complete system as described herein and as shown on the drawings.
2. The VMS components provided under this scope of work shall be compatible with the existing VMS and shall function as an integral part thereof. The existing enterprise-wide network video system is manufactured by Video Insight.
3. Contractor shall be responsible for providing equipment, licenses and software to achieve the specified system performance described herein and, by reference, realize absolute and seamless compatibility with the existing system.
4. Contractor shall ensure system additions and modifications provided under this scope of work have no negative effect on the existing systems and operations, and no permanent effect beyond that specified or implied by the scope of work unless otherwise noted herein.

B. Purpose:

1. The System shall provide the ability to record images received from cameras located throughout DPS facilities in a digital format.
2. The System shall allow operators to view live video images in single and multiple-camera formats and retrieve the recorded video information, based on parameters requested by the user.

C. Environment:

1. The system shall be wholly contained within the District buildings, but shall also be fully integrated with the Districts global and enterprise Electronic Access Control systems (EACS) at the DPS Department of Technology Network Operations Center and other remote sites.
2. Video Processing Components shall be distributed, and located in MDF/IDF rooms, as shown on the drawings or as directed by the Owner. See the drawings for details on equipment locations of this project.
3. Central Administrative Post: The video management service application is located in the PSA Central Command Center. System programming, configuration and control shall occur at this location or as directed by the Owner.
4. Building Administrative Post: Where applicable, Video Client workstations shall be located as shown on the drawings. Site surveillance, site camera configuration, and review of recorded images shall occur at this location.
5. Infrastructure Connectivity:
 - a. The video camera and processing components at each site shall utilize a combination of standard copper cable, fiber optic cable, IP or wireless transmission schemes, depending on individual site conditions.
 - b. Local Sites: The wired Video Encoder/decoders and Video System (VMS) Client Workstations shall reside on the building LAN or network segment.
 - c. Enterprise: Local LAN networks are connected to the DPS WAN network, to establish VMS connectivity between DPS sites and the DPS Department of Technology Network Operations Center. Coordinate LAN/WAN requirements for this project with the Owner.

D. Attributes

1. General

- a. The Video Management system (VMS) is existing and is a subset of the EACS Software. Refer to Specification Section 28 13 00, Electronic Access Control Software and Section 28 07 00 Security System Integration for coordinating information.
- b. The system shall comprise network video servers, video clients, digital storage devices, router/switches, and ancillary equipment assembled into a fully operating system.
- c. Field Components: Field Components shall comprise video cameras, positioning devices, lenses, video encoders, camera mounts and housings and other video system devices and wiring as described herein and shown on the drawings.
- d. Video Processing Components: Video processing components shall comprise computer video servers, encoders / decoders, digital storage devices, computer video monitoring stations, and other video processing devices as described herein and as needed to provide the required functionality.
- e. Quality: The initial quality/compression parameters shall be set as determined by the Engineer and the Owner at the time of commissioning. Minimum video quality shall be equivalent to 4CIF video quality, as judged by Owner and Owner's representatives.

2. Integrated Digital Video Management System

- a. The VMS / EACS (Spec Section 28 13 00) is provided by **Panasonic – Video Insight**. Sites without DPS Network shall include a **Video Insight** NVR.

PART 2. PRODUCTS

2.01 GENERAL

- A. Product Acceptability: The Products section contains lists of acceptable products. ~~If product NO~~ substitutions are proposed, they must be made based upon a comparison of equivalence to the product specified. Considerations may include but shall not be limited to functional, physical, aesthetic and/or interface aspects. The Owner shall be the sole judge of whether or not a submitted substitution is deemed to be "equivalent" to that specified.

1. ~~Specific Requirements for Substitutions.~~

- a) Resolution: Minimum of 1280 x 960 (1.3 MP) up to 2048 x 1536 (3 MP)
- b) Frame Rate: Stream up to 30 frames per second
- c) Video compression: M-JPEG / MPEG-4 / H.264
- d) Power: PoE Class 2,3, PoE+ and auxiliary power
- e) Network: IPv4/v6, QoS, 100Base-T Ethernet
- f) ONVIF Profile S Conformant
- g) Tamper/vandal resistant
- h) IP66 rating (for exterior cameras)
- i) Integrated PTZ control through serial or IP

2.02 VIDEO MANAGEMENT (VMS) EQUIPMENT

- A. Exterior ~~Color, Day/Night, 3.0 Megapixel Resolution, Vandal Dome Network~~ Camera.

1. The unitized dome/camera assembly shall be a ~~Sony SNC-DH260~~ ~~Panasonic WV-S253 ILN~~, compatible with the DVMS.

The product shall be used for all parking lot/exterior large view areas, building mounted/non-wireless exterior and gymnasium installations.

- B. Interior, ~~Color, Day/Night, 1.0 Megapixel Resolution, Vandal Dome Network~~ Camera.

- ~~1. The unitized dome/camera assembly shall be an AXIS-P3354~~ ~~Panasonic WV-S2131L~~, ~~compatible with the DVMS.~~

The product shall be used for all interior uses.

- ~~C. Interior, Color, Day/Night, 5.0 Megapixel Resolution, Vandal Dome Network~~ Camera.

- ~~1. The unitized dome/camera assembly shall be an AXIS-M3027 PVE, compatible with the DVMS.~~

The product shall be used for all interior 180° uses.

- ~~D. Exterior, Color, Day/Night, 1.3 Megapixel Resolution, Vandal Dome Network~~ Camera.

- ~~1. The unitized dome/camera assembly shall be a Sony SNC-DH160, compatible with the DVMS.~~

The product shall be used for all exterior entrance/exits.

- ~~E. Exterior Color, Day/Night, 2.0 Megapixel Resolution, Vandal Dome Network Pan/Tilt/Zoom~~ Camera.

- ~~1. The unitized dome/camera assembly shall be a Sony SNC-RH164, compatible with the DVMS.~~

The product(s) shall be used as necessary for all wireless and wired PTZ installations.

- F. Roof Top - "Gravity" or "Sled" Mount.

1. Installation of equipment on DPS rooftops must not penetrate roof structure. Mount must include the construction of a non- penetrating mast, gravity held installation. Proper weight substance, i.e. cinder blocks or patio blocks, must also be provided to prevent mount movement during inclement weather experienced in Colorado.
2. The rooftop mount shall consist of a medium duty mount designed to mount an outdoor pendant dome to the top or flat horizontal surface of a rooftop along with any accessories which may be required for a complete installation.
3. Powder coat or galvanized/stainless steel finish construction.
4. Installation will require a Friction Mat depending upon roof top surface.

E. Parapet Mount:

1. The parapet mount shall consist of a medium duty mount designed to mount an outdoor pendant dome from the outside or inside surface of a roof parapet or similar structure.
2. All cable to be routed internally through mount.

H. Wireless Camera Enclosure:

1. Fixed HD IP and HD IP PTZ cameras compatible.
2. Impact resistant polycarbonate thermal plastic or powder coat finish, white or light color aluminum or steel.
3. IP 66 rated enclosure, IP 68 rated connection ports.
4. Heater and blower available to guarantee operating temperature range (-20° C to +50° C) / (-4° F to +122° F).
5. Onboard component mounting space for routers, cell networks, hard drives, UPS, WiMAX, mesh hardware, etc.
6. Available antenna mounting space or tab.
7. Lens: Lower dome lens shall be vandal resistant, impact resistant with an optically pure, clear polycarbonate dome lens.
8. Power Requirements: Input - 220/110VAC, Output – 24VDC or 12VDC

I. Wireless Mesh Nodes:

1. Wireless mesh nodes are to provide reliable, seamless Ethernet connectivity over a high-performance, self-forming, and self-healing wireless mesh network backbone. The mesh network must securely handle concurrent video, voice, and data applications.
2. Exterior:
 - a. 18/4 stranded shielded cabling will be installed for conductivity of power to the Wireless Mesh Node. Due to extended cable length, the included power supply will not be sufficient. Include a DC power supply minimum output of 16Vdc in your pricing to maintain the voltage requirement of 12.75 to 17.25 Vdc.
 - b. Power over Ethernet (PoE) Midspan Power Injector & Splitter.

- c. Security cameras are to be powered by PoE. Midspan power injector to be used when existing switch is without built-in PoE support or camera requires more than 15w.
- d. Output Power: Match voltage to end device requirements.
- e. Installation and Management: Plug-and-Play installation; automatically detects PoE and High PoE-enabled devices and supplies inline power. Local LED management display.
- f. The exterior cameras shall be provided with surge protection on both the Ethernet cabling and power cabling.

J. LCD Monitors:

1. General Requirements:

- a. Color display.
- b. Black ~~AND/OR SILVER~~ finish.
- c. 720p resolution.
- d. 16:9 widescreen.
- e. Speakers not needed.
- f. VESA compliant mount.
- g. High contrast ratio.
- h. *32" LCD monitor – wall mount.*
- i. *22" LCD monitor – countertop.*

K. IP Video Encoder:

- 1. Encoder to be supplied by ~~Video Insight~~ Panasonic – Video Insight.

PART 3. EXECUTION

3.01 GENERAL

- A. In accordance with Section 28 05 00, Security System General Requirements.

3.02 SYSTEM CONFIGURATION:

- A. Camera recording and display configurations shall be arranged via a combination of the Video Server, Network Video Recorders, Video Monitoring Workstations, and LAN/Wireless LAN network.
- B. Contractor shall coordinate with the Owner to determine the required pre-programmed surveillance and event-initiated configurations.

3.03 ACCESS CONTROL SYSTEM INTEGRATION

- A. Provide Access Control system integration equipment, software and programming, in accordance with Section 28 05 00, Security System General Requirements.

3.04 EQUIPMENT, RACK AND CONSOLE INSTALLATION

- A. In accordance with Section 28 05 00, Security System General Requirements.

3.05 GROUNDING PROCEDURES

- A. Provide grounding of all systems and equipment in accordance with Section 28 05 00, Security System General Requirements.

3.06 WIRE AND CABLE INSTALLATION PRACTICES

- A. Provide wire and cable installation in accordance with Section 28 05 00, Security System General Requirements.

3.07 WIRE AND CABLE

- A. General: Cables which are not installed in conduit shall be a version of the specified cable rated for use in plenums.
- B. System cable: Provide cable as shown below, or as recommended by the Manufacturer.
 - 1. Video: Panduit CAT 6.
 - a. SurgeGate 1-Gb CAT6-75 protection device required for all exterior cameras.
 - 2. Network Cable: Reference Section 27000 Panduit Enhanced Standards required by Owner.
- C. Cable installed below grade shall be rated for immersion in water.

3.08 DATABASE PREPARATION, CHECKING, AND ACTIVATION

- A. Provide database preparation, checking and activation for systems and equipment in accordance with Security System General Requirements, Section 28 05 00.

3.09 START-UP RESPONSIBILITY

- A. Provide start-up services for all systems and equipment in accordance with Security System General Requirements, Section 28 05 00.

3.10 PRELIMINARY INSPECTION AND TESTING

- A. Provide preliminary inspection and testing services for systems and equipment in accordance with Testing and Commissioning, Section 28 08 00.

3.11 SYSTEM PERFORMANCE TESTING AND ADJUSTING PROCEDURES

- A. Provide performance testing, burn-in, and adjusting of systems and equipment in accordance with Testing and Commissioning, Section 28 08 00.
- B. VMS Performance Testing
 - 1. Demonstrate acceptable picture quality and camera views on each camera.

2. Demonstrate acceptable picture quality on each video monitoring workstation, and display devices accessible over the Wireless LAN.
3. Demonstrate no tearing of video is observed while Pan-Tilt –Zoom cameras are being repositioned.
4. Demonstrate switching, recording and playback functions for the video server, and digital video recorders.
5. Demonstrate camera positioning functionality, on pan/tilt/zoom cameras, throughout the entire range of possible camera positions.
6. Ensure primary views are acceptable. Demonstrate the view obtained by each pre-programmed camera position.
7. Demonstrate automatic event-initiated recording sequences, including camera pre-positioning, where applicable.

3.12 BURN-IN PERFORMANCE PERIOD

- A. Provide a burn-in performance period to demonstrate the stability of the system, in accordance with Testing and Commissioning, Section 28 08 00.

3.13 COMMISSIONING AND VALIDATION

- A. Provide commissioning and validation services to prove and improve the effectiveness of the system, in accordance with Testing and Commissioning, Section 28 08 00.
- B. Coordinate with the Owner, or the Owner's representative, for the provision of these services.

3.14 FINAL PROCEDURES

- A. Perform final procedures in accordance with Section 28 05 00, Access Control General Requirements.

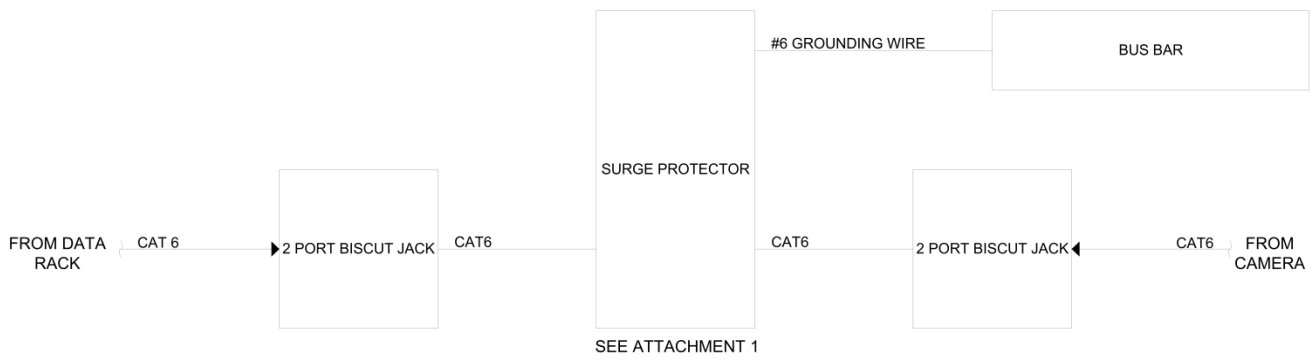
4.00 EQUIPMENT SCHEDULE

27 23 00 - Video Management System (VMS)

| Description | Mfg. | Part Number | Special Rqmt. |
|----------------------------------|-----------|---------------------|-----------------------|
| Interior Camera | Panasonic | WV-S2131L | |
| Exterior Camera | Panasonic | WV-S2531LN | |
| Parapet Rooftop Mount | Pelco | PP351 | |
| Parapet Wall Mount | Panasonic | PPRM30GB | |
| Wall Mount Kit | Panasonic | PWM485S | |
| Corner Mount Kit | Panasonic | PCM485S | |
| Pole Mount Kit | Panasonic | PPM485S | |
| Gravity Sled | Rohn | FRM238SP5 | |
| Gravity Sled Mat | Rohn | FRMPAD | |
| Gravity Sled Mast | Rohn | FY253 | |
| PoE Ethernet Extender - powered | Vigitron | Vi2701TX & Vi2701RX | |
| 12vDC Wall-Mount Power Supply | Vigitron | Vi0012 | |
| PoE Ethernet Extender - passive | Veracity | VOR-ORM | |
| Surgegate 1 GB CAT6-75Suppressor | TWLINK | 2090-192-30B | For exterior cameras |
| IP Camera License | Panasonic | IPsv7 | |
| 1 Channel Encoder | Advidia | VP-1 | |
| 32" 1080P Monitor | LG | 32LD452B | (Or Comparable Model) |
| Tilt/Swivel dual-arm Wall Mount | Pelco | PMCL-WM2A | (Or Comparable Model) |
| Orange 5E Patch Cords | | | DoTS Spec. |

5.00 ONE-LINE DRAWINGS

- A. 28 23 00-1 Typical Video Camera Wiring Diagram
- B. 28 23 00-2 Typical Video Camera Wiring Diagram-VI Server
- C. Surge Protector Drawing For Exterior Devices



END OF SECTION 28 23 00