



## Security Bid Package

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USPS – 8120 Hardeson Road  
Everett, Washington 98203-6289  
United States

Security Bidders (Access Control and Video Management) Proposals shall be based on the USPS approved design documents and standard specifications provided by Patriot Construction Management.

Security Design will be provided by Patriot Construction Management Technology Lead

Charles Jewell

[Charles.Jewell@patriotccm.com](mailto:Charles.Jewell@patriotccm.com)

Contact 918-568-2383

All Security bidders need to send their bid to Charles Jewell at Patriot Construction Management for review. The following needs to accompany the bid.

- Site design that bid was based on.
- Line-Item pricing.
- Model numbers and descriptions.
- Listed Manufacturers to be used.
- Detailed scope of work for installation.
- Product submittals.
- Server Calculations – 30 days retention with 30% growth
- Firm and final bid.

Contractors are encouraged to walk the site and confirm existing conditions.

Access Control door hardware will need to be field verified by Security Integrator. If site has existing access control doors the following applies:

- 1) Postal approved Vanderbilt access control hardware will remain and be expanded to include additional doors specified on provided design. If hardware and readers need updated, please include in proposal.
- 2) Postal non-approved access control system. Door locations will be added to proposal as additional doors that need to be brought up to Postal standards per ePacs design criteria.

Please contact Charles Jewell to arrange an introduction with site contacts to notify them of your presence on site.

Bids will be based on qualified bidder that adheres to best USPS standards, pricing, and schedule.

Bids will not be accepted if the above criteria have not been followed.

Please email all RFI's to Charles Jewell at Patriot Construction Management.

## Scope of Work:

Cameras: Combined between business units. Network live feeds for facilities and local NVR servers for inspection services storage of recorded video (30days).

1. (79) cameras in total for Inspection Services. These cameras will be connected to the March Recorders.
2. (16) cameras in total for Operations Analytic network. These cameras are live view 1fps on the Postal network. Not tied to the March recorders.
3. Camera models/quantities per the attached drawing:
  - P3267-LVE (single lens): Qty 10
  - XNF-9010RV (12MP Fisheye): Qty 32
  - PNM-9031RV (180 Degree): QTY 5
  - QNF-9010 (12MP Fisheye interior): QTY 27
  - XNF-8010RV (6MP Fisheye): QTY 0
  - QNF-8010 (6MP Fisheye): QTY 0
  - PNM-9000VD (Dual Head): QTY 0
  - PNM-9022V (180 Multi): QTY 0
  - PNM-9322VQP (270 Multi): QTY 0
  - M5000-G (Multi sensor W/PTZ): QTY 16
4. March Network Recorders sized for 30 days and must have 30% for future expansion.
  - March Network X-Series IP Recorder **Section 2.2**
  - March Network licenses provided by USPS.
5. NVR and monitor to be located in Inspectors Office.
6. Monitor: Samsung #F27T450FQN.
7. Alternate Models: Dell #P2722H
8. Remote Nodes -Great Lakes Enclosure Model DC07844A: QTY 3
9. Head End - Great Lakes Upright Rack Model GL7202436: QTY 1
10. Triplite Smart1000RMXL2U: QTY 1 per Head End and Remote Node
11. Hanwha Decoder Model SPD-152: QTY 1 Located in the Post Masters Office
12. Cisco Series 9200 – C9200L-24P-4G-A: QTY 2
  - Refer to section 282305 Line **2.3 – Integrated Security and Investigative Platform CCTV** System for required components per switch.
  - Only security cameras are to be plugged into provided switches.
  - Analytic cameras will plug into different Postal network.

## Access Control: Vanderbilt

1. Layout only shows general guidance as to what doors will need access control. You will want to refer to Standard Design Criteria, Module 2A, Section 5.7.4 for specific equipment at any given door. Generally speaking:
  - a. All doors labeled with a 'CR' refers to a door with a card reader (read in), door contact, request to exit motion sensor and appropriate selection of either door strike or maglock.
  - b. All doors labeled with a 'DA' and 'DC' are exit only doors and will only be provided with a door contact monitored by the access control system and a physical door alarm to sound locally when opened without authorization.
  - c. Access Control Headend location to be identified on provided floorplan.

Attached specifications for review include:

1. Handbook AS-503 Standard Design Criteria. Applicable sections are Sections 5.7 of Modules 1 and 2a.

2. USPS CCTV Security Design Requirements. Note: Securitas is no longer required nor recommended.
3. USPS SDC 281304 ePACS Requirements
4. USPS camera programming requirements

## SECTION 282305

### INTEGRATED SECURITY AND INVESTIGATIVE PLATFORM (ISIP) CCTV SYSTEM

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

*This is a Type 3 Specification with primarily required text; therefore, most of the text cannot be edited, but there is editable text which is noted within the Section with a "Note to Specifier." Do not revise the required paragraphs without an approved Deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.*

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements. See the "Using the USPS Guide Specifications" document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the "last revised" date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, "USPS MPF SPECIFICATION" with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Provide and install a complete IP Video System including, but not limited to:
  - a. IP Video Surveillance Cameras, housings, mounts, power supplies, cabling, and related equipment.
  - b. Video management software.
  - c. Video monitoring and recording equipment.
  - d. Equipment enclosures and remote node cabinets.
  - e. Network equipment including routers and switches.

###### B. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents including:

1. System Installation Manuals (provided by the manufacturer) shall be left on-site during the final acceptance. Manuals will not be provided prior to installation completion.

- C. Related Sections:
  - 1. Section 260500 – Common Work Results for Electrical.
  - 2. Section 260533 – Raceway and Boxes for Electrical Systems.

## 1.2 REFERENCES

- A. The references listed below form a part of this specification:
  - 1. NFPA 70 - National Electrical Code.
  - 2. ANSI / TIA / EIA 568-C Commercial Building Telecommunications Cabling Standard.
  - 3. ANSI / TIA / EIA 569-B Commercial Building Standard for Telecommunications Pathways.

## 1.3 SYSTEM DESCRIPTION

- A. All equipment including the cameras, camera housings, camera mounts, NVR's, monitors, network switches, headend racks, node cabinets, CCTV terminal cabinets, fiber equipment enclosures, etc.
- B. Power, conduit, cable tray, cable, and cable pulling and NEMA 1/ NEMA 4 Enclosures to be used as part of the installation.

## 1.4 DEFINITIONS

- A. "Non-Blue Sky": The following camera locations are considered to be non-blue sky applications:
  - 1. Interior cameras.
  - 2. Exterior building mounted cameras (covered or uncovered).
  - 3. Exterior cameras covered by an overhang or canopy or similar protection.
- B. "Blue Sky": Exterior cameras mounted remote from the building exterior wall are to be considered "blue sky" applications.

## 1.5 SUBMITTALS

- A. Section 013300 - Submittal Procedures:
  - 1. Product Data: Manufacturer's specification sheets for each component shall be required for all products provided.
  - 2. Due to USPS security requirements, submittals will be limited to one electronic copy of the block diagram and one copy of the shop drawings.
  - 3. Final As-Built Drawings and Installation and Operation Manuals will be supplied directly to USPS at [uspscctv@usps.gov](mailto:uspscctv@usps.gov) and stored within the headend rack per USPS Project Manager.
- B. Shop Drawings:
  - 1. Provide a Standard Drawing Package that shall be utilized for the installation of the CCTV system. This package shall include:
    - a. Block Diagram: System block diagrams noting major system components and interrelationships of each component.
    - b. Headend Equipment Racks and Remote Node Cabinets: Elevation drawings showing the arrangement of all components within the remote node cabinets and headend equipment rack(s).
    - c. AutoCAD electronic copies of the final camera placement drawings, camera schedules, headend and remote node locations, and all monitors.
    - d. Dimensioned and scaled elevation drawings for each CCTV terminal cabinet and fiber equipment enclosures showing the location of fiber media converters, fiber patch boxes, power supplies, receptacles, ethernet extenders, surge protectors and other CCTV.

components. Elevation drawings shall be submitted and approved prior to ordering the terminal cabinets and equipment enclosures.

e. Cable routing plans shall be provided prior to installation of the cabling.

C. Field Testing Reports for Category 6 Copper and Fiber Optic Cable

1. Test reports: All testing must be performed using industry standard, compliant test equipment that stores the test results in internal memory and produces test result reports. Test results shall be provided in test equipment format (RAW Electronic). Vendor generated spreadsheets are not acceptable. Paper test results are not acceptable.
2. Submit test reports prior to installation of any cameras, node cabinets or the headend equipment.

D. Sequence and Scheduling Plan: Provide installation scheduling plan for review and approval.

E. Section 017704 – Closeout Procedures and Training:

1. Product Quick Reference cards for the operation of all key system components.
2. Project Record Documents: Provide field-accurate drawings that reflect actual locations of cameras, indicating cable routings, cable identifiers, layout, location, and numbering of system devices to reflect as-built conditions.
3. Provide a final materials list of equipment installed. Materials list shall include model number, serial number, and date installed.
4. Project Completion Certification: Document signed by a USPIS Physical Security Specialist indicating that the project is fully complete with all punch-listed items resolved.
5. Operating Instruction:
  - a. Provide on-site instruction, upon request, to review the operation of the system and detail any common troubleshooting or maintenance that is required to ensure normal operation. Authorized USPS (USPIS & USPS OIG) Representatives will receive this training.
  - b. Provide one complete set of equipment operating and installation manuals that will be stored in the headend rack per USPS Project Manager.

## 1.6 QUALITY ASSURANCE

A. Installation Contractor:

1. Company with a minimum of five years system design, engineering supervision, and installation experience in the CCTV industry.
2. Company that is trained and authorized to install “Axis”, “March Networks” and “Hanwha Techwin” products. The CCTV wiring shall be installed by a CCTV systems installer trained, authorized, and certified as a Network Camera Technician to install and wire the Axis, March Networks, and Hanwha Techwin products.
3. Company that has been successfully installing CCTV systems of equal size and complexity for a minimum of five years. Submit a minimum of three references. System references shall include projects where software and hardware installed is similar to the software and hardware proposed for this project.
4. Furnish all labor, services, and materials necessary to furnish and install a complete, functional CCTV system. The System shall comply in all respects with the requirements of the specifications, manufacturer’s recommendations, and Underwriters Laboratories Inc. (ULI) listings.
5. Furnish certification that the entire CCTV system has been inspected and tested, is installed entirely in accordance with the applicable codes, standards, manufacturer’s recommendations, and UL listings, and is in proper working order.
6. The USPS requires professional workmanship from an experienced “CCTV systems” contractor and will reject any faulty workmanship or installation methods not meeting their satisfaction.

## 1.7 DELIVERY, STORAGE AND HANDLING

A. Section 016000 – Product Requirements: Transport, handle, store, and protect products.

- B. Keep devices and equipment in manufacturer's packaging in a secured, air-conditioned location until system is ready for installation.
- C. Comply with manufacturer's requirements. Coordinate storage location with the Postal Service.
- D. The equipment delivered must be insured at the Contractor's expense through acceptance.

## 1.8 PROJECT CONDITIONS

- A. Verify customer location has 10X network available for installation of system via USPS site project manager or USPS IT.

## 1.9 WARRANTY/SERVICE/TECHNICAL SUPPORT PLAN

- A. Warranty:
  - 1. Include manufacturer warranty for one year after facility acceptance and project completion certification for materials and labor.
    - a. Service plan shall include all parts and labor, the cost of utilizing a lift truck (if required) and shall include return shipping. Failed equipment shall be repaired or replaced at no charge to the Postal Service during the warranty period.
    - b. USPS shall not be required to process any paperwork in order to be entitled to service plan coverage. It is the General Contractor's sole responsibility to monitor and comply with warranty eligibility.
    - c. Any communication issues identified by the USPS and mutually agreed upon as 'level one' bugs (impacting operation with no work-around) shall be rectified within two weeks of their being reported.
    - d. Any communication issues identified by the USPS and mutually agreed upon as 'level two' bugs (impacting operation but with a work-around) shall be rectified within 90 days of their being reported.
    - e. Turnaround time for all repairs (warranty and out-of-warranty) shall not exceed 72 hours.
- B. Technical Support:
  - 1. The General Contractor shall provide toll-free, 24/7 telephone number and/or email address for technical support at no charge throughout the warranty period.
  - 2. Data Recovery: Provide a service to assist the USPS in recovering data from digital recording system hard drives and removable storage media in the event of a failure.
    - a. Turnaround time for data recovery shall be less than seven days from receipt of hard drives at "March Networks" data recovery center.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
  - 1. Axis Communications
  - 2. Black Box
  - 3. Cisco Systems, Inc.
  - 4. Costar Video Systems
  - 5. Dell Technologies
  - 6. Digital Watchdog
  - 7. Ditech Surge Protection
  - 8. Great Lakes Case and Cabinet Co., Inc.

9. Hanwha Techwin, Co. LTD
10. ICC
11. Lantronix
12. March Networks Corporation
13. Middle Atlantic Products
14. Oncam Global Limited
15. Optical Cable Corporation (OCC)
16. Orion Images Corporation
17. Ortronics (Legrand) Corporation
18. Panduit Corporation
19. Transitions Networks
20. Tripp-Lite by Eaton

B. Section 016000 – Product Requirements:

1. Product options and substitutions are not permitted without a written and USPS/USPIS approved deviation.
2. All equipment to be supplied under this specification shall be new and the current model of the manufacturer.
3. Systems and components shall have been thoroughly tested and proven in actual use.

2.2 NETWORK VIDEO RECORDERS AND STORAGE

A. Based on the Construction Documents, purchase all equipment from the authorized manufacturer.

B. Headend and Network Video Recorder requirements:

1. NVR/Storage Requirements: NVR storage, processor, and RAM requirements will be based off a mathematical formula from the information obtained during the site survey process. Once the number, type and classification of cameras are approved by all parties, it will calculate the required NVR(s) fit for the site (minimum of 3 NVR's per site).
  - a. Storage for 30 Days continuous video with 30% expansion capability and motion identified assuming a frame rate of no less than 15 fps.
  - b. Dual Network Interface Cards on board and 4 additional GB NIC ports via PCIe card per USPS requirements. The USPS requires 1 connection on the USPS network per NVR. Thus, each NVR will have (at minimum) 2 USPS 10X Network connections.
  - c. UPS Power Supplies for NVR and Storage.
  - d. Input Power: 120VAC, 60Hz.
  - e. Software: "March Networks Command Client" Video Management System.
  - f. All items rack mounted.

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**NOTE TO SPECIFIER**

*The headend rack shall contain a minimum of (3) NVR's to avoid a facility wide camera failure should (1) NVR become inoperative. The NVR's shall be appropriately selected as 32, 48 or 64 channel type to comply with this requirement.*

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2. Network Video Recorders (NVRs) shall be high capacity, high-definition IP recording with RAID and have the following minimum features:
  - a. Video
    - 1) Channel Capacity: 30 fps at up to 1080 primary channel; 15 fps at D1 secondary channel.
    - 2) Video Compression: H.264 & H.265, up to 4K resolution.
    - 3) Max IP Camera Inputs: 32, 48 or 64.
    - 4) IP Camera Performance: Standalone 600 Mbps.
    - 5) Video Output: HDMI.
  - b. Network

- 1) Network 1: GigE port for connection to corporate network.
  - 2) Network 2: GigE port for connection to camera network.
  - 3) Network 3: GigE port for connection to redundant network, metadata capture.
  - 4) Security: TLS 1.2 with strong AES encryption, HTTPS encryption, strong hashing algorithms SHA256, continuous security vulnerability assessment.
  - 5) Interface: 10/100/1000Base-T Ethernet (3 x RJ-45).
- c. Systems/Network Management
- 1) Operating system: Linux.
  - 2) Bandwidth Throttle.
  - 3) Bandwidth Scheduling.
  - 4) Adaptive Bandwidth.
  - 5) Remote Connection: TCP/IP (IPv4).
  - 6) Concurrent Remote Connections: No set limit.
  - 7) Internal Battery.
- d. Analytics to include motion detection and face detection.
- e. Storage
- 1) Internal Hard Drives: up to (8) 3.5-inch HDDs.
  - 2) Individual Drive Capacity: Up to 20 TB.
  - 3) Total Storage Capacity: Up to 160 TB.
  - 4) Drive Type: Serial ATA (SATA).
  - 5) Mirroring.
- f. Hardware
- 1) SOC: Nvidia Jetson Platform.
  - 2) CPU: 4 ARM core 64-bit processors.
  - 3) GPU: Up to 256 GPU cores.
- g. Alarm Inputs/Outputs
- 1) Alarm Inputs: 8 current loop inputs, supporting open and closed detection.
  - 2) Relay Inputs: 4 relay switch outputs (60 VDC, 1A); programmable event driven.
- h. Physical
- 1) Dimensions (HxWxD): 3.5x19.0x21.0 in.
  - 2) Mounting: 2U high, 19-inch rack mount.
- i. Environmental
- 1) Operating Temperature: 0 degrees C to 40 degrees C (32 degrees F to 104 degreesF).
  - 2) Heat Dissipation: Maximum 188 BTU per hour (system plus 4 hard drives).
  - 3) Humidity: 5 percent to 95 percent RH (non-condensing).
  - 4) Storage Conditions: -40 degrees C to 70 degrees C (-40 degrees F to 158 degreesF).
- j. Electrical
- 1) Internal Power Supply: Dual redundant hot swap, 115 VAC, 2.5A, 60 Hz.
  - 2) Power Consumption: 85W typical, 150W Max.
- k. Warranty: 3 years – parts/labor/shipping.
- l. Basis of Design:
- 1) March Networks #X32 (32 Channel).
  - 2) March Networks #X48 (48 Channel).
  - 3) March Networks #X64 (64 Channel).
  - 4) Product substitutions not permitted.

## 2.3 IP VIDEO SWITCH

### A. CISCO Network Switch (IP Video):

1. CISCO Systems (CISCOPRO) Switch.
2. Five (5) year service warranty.
3. Basis of Design: CISCO Catalyst 9200L, (24) port PoE+, 4x1G Network Advantage Switch #C9200L-24P-4G-A with the following options:
  - a. C9200L Network Advantage, (24) port license; #C9200L-NW-A-24.
  - b. North American AC type "A" power cable; #CAB-TA-NA (2 required per switch).



- c. C9200L CISCO DNA Advantage, (24) port, (5) year term license, (60) month service duration; #C9200L-DNA-A-24-5Y.
  - d. Prime infrastructure lifecycle and assurance term-smart license; #PI-LFAS-T.
  - e. Prime infrastructure development license for lifecycle and assurance term – 5Y service duration, (60) months; #PI-LFAS-AP-T-5Y.
  - f. CISCO Catalyst 9200L stack module; #C9200L-Stack-Kit (required at headend rack only).
  - g. Catalyst 9200 stack module; #C9200-Stack (required at headend rack only).
  - h. 50CM Type 4 stacking cable; #Stack-T4-50CM (required at headend rack only).
  - i. Network plug-n-play connect for zero touch device deployment; #NETWORK-PNP-LIC (required at node cabinets only).
4. The network video switches shall be furnished and programmed by the USPS. Switches to be installed and wired by the General Contractor.

#### 2.4 VIDEO DECODERS

- A. Video Decoders shall be (64) channel and support up to (2) remote monitors with full screen camera views; (4) to (16) camera views per monitor.
- B. Camera displays approved only by OIG and USPIS.
  - 1. Video Output - HDMI.
  - 2. Video Decoding - H.265, H.264 and MPEG-4 Unicast and Multicast.
  - 3. Security – Password protected user access HTTPS encryption.
- C. Decoder shall be wall mounted behind the CCTV monitor(s) utilizing factory wall brackets. The decoder shall be supplied with 120 Volt obtained from the monitor's UPS unit.
- D. Basis of Design: Hanwha Techwin #SPD-152.
- E. Alternate manufacturer: Vicon #VECA-SF00N0-00.

#### 2.5 VIDEO CAMERAS

- A. IP Cameras for video surveillance and monitoring of specific areas as shown on the drawings and confirmed with Postal Inspection Service and/or OIG through the USPS Project Manager.
- B. Fixed, indoor/outdoor, 5 MP (minimum), dome type camera shall be a network camera with WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet. The camera shall meet or exceed the following requirements:
  - 1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  - 2. Include a vandal resistant, indoor/outdoor casing with smoked transparent cover where required.
  - 3. Equipped with pixel counter.
  - 4. Image sensor: 1/2.7-inch Progressive scan RGB CMOS.
  - 5. Lens:
    - a. Varifocal, 3 to 8mm, F1.3
    - b. Horizontal field of view: 104 degrees - 40 degrees
    - c. Vertical field of view: 74 degrees – 29 degrees
    - d. Minimum focus distance: 1 m (3.28 ft.)
    - e. IR corrected, remote zoom and focus, P-Iris control.
  - 6. Day and night: Automatically removable infrared-cut filter.
  - 7. Minimum illumination:
    - a. Color: 0.13 LUX @ 50 IRE, F1.3. b. B/W: 0.0 LUX @ 50 IRI, F1.3.
  - 8. Shutter speed: 1/33500 to 1/5 second; 60 Hz.
  - 9. Pan/Tilt/Zoom: Digital PTZ, preset positions, guard tour.

10. Angle Adjustment: Pan  $\pm 180$  degrees, tilt -10 to +80 degrees, rotation +190 degrees.
11. Resolution: 2592x1944 (5 MP minimum).
12. Video compression:
  - a. H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles.
  - b. H.265 (MPEG-H Part 2/HEVC), Main Profile.
  - c. Motion JPEG.
13. Frame Rate: 30 fps in all resolutions; 60 Hz
14. Video streaming: Multiple individually configurable streams in H264 and H265 and Motion JPEG.
15. Support both unicast and multicast MPEG-4.
16. Support Power over Ethernet according to IEEE802.3af.
17. Support both IPv4 and IPv6.
18. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
19. Be equipped with 1 alarm input and 1 alarm output.
20. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
21. Be supported by an open and published API.
22. Casing: Indoor/Outdoor; IP52, NEMA 4X and IK10 impact resistant, polycarbonate dome with encapsulated electronics (1.8 lbs.).
23. Processor and Memory: ARTPEC-8, 2048 MB RAM, 8192 MB Flash.
24. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
25. Operating Conditions: Indoor/Outdoor; -40 to 122 degrees F; 10 to 100 percent RH.
26. Accessories: Mounting plate, smoked transparent cover. Provide ceiling, pendant or wall bracket mounting and connector kits.
27. Basis of Design:
  - a. Indoor: Axis #P3267-LV.
  - b. Outdoor: Axis #P3267-LVE.
28. Alternate manufacturers:
  - a. Hanwha Techwin #XND-C8083RV (indoor)
  - b. Hanwha Techwin #XNV-C8083R (outdoor)
  - c. March Networks #ME6 – indoor/outdoor IR dome

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**NOTE TO SPECIFIER**

*In certain applications such as irregular shaped areas, a PTZ camera may be utilized as an alternative to a 360-degree panoramic (fisheye) or 180 degree panoramic camera. Attain approval from the PSS, the OIG and USPIS for the use of PTZ cameras.*

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- C. Indoor/Outdoor PTZ camera shall be a network dome camera and shall incorporate 25x (minimum) optical zoom, day/night functionality, and simultaneous Motion JPEG and MPEG-4 video streams. Camera Shall meet or exceed the following requirements:
  1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  2. Include a vandal resistant, indoor/outdoor casing with smoked transparent cover.
  3. Feature a progressive scan CMOS sensor with Wide Dynamic Range (WDR), electronic image stabilizer and day/night functionality.
  4. Be equipped with 25x optical zoom (minimum).
  5. Image Sensor: 1/2.8" Progressive scan RGB CMOS.
  6. Lens: Varifocal, F1.4 to F4.0, 4.3 to 137.6 mm, angle of view: Horizontal – 58.3 to 2.4 degrees, vertical – 35.5 to 1.4 degrees.
  7. Day and night: Automatically removable infrared cut-out filter.
  8. Minimum Illumination:
    - a. Color: 0.1 LUX @ 30 IRE F1.4. b.
    - B/W: 0.01 LUX @ 30 IRE F1.4.

9. Shutter Time: 1/66,500s to 2s.
  10. PTZ:
    - a. E-Flip, 256 preset positions.
    - b. 32x optical zoom and 12x digital zoom, total 384x zoom.
    - c. Pan: 360 degrees endless, 0.1 to 350 degrees/s.
    - d. Tilt: 180 degrees, 0.1 to 350 degrees/s.
  11. Video Compression: H264 (MPEG – 4 part 10/AVC) baseline, main and high profiles motion J-PEG.
  12. Resolution: 1920 x 1080 (2 MP minimum).
  13. Frame Rate: Up to 60 fps in all resolutions.
  14. Video streaming: Multiple individually configurable streams in H264 and H265 and Motion JPEG.
  15. Support multiple, motion JPEG4, H264, and H265.
  16. Support Power over Ethernet according to IEEE802.3af.
  17. Support both IPv4 and IPv6.
  18. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
  19. Be equipped with full memory card for alarm triggers.
  20. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
  21. Be supported by an open and published API.
  22. Casing: Indoor/Outdoor; IP66, IK10 and NEMA 4X impact – resistant aluminum.
  23. Processor and Memory: 1024 MB RAM, 512 MB Flash.
  24. Connectors: RJ45 10 BASE – T/100BASE-TX PoE push-pull connector for (2) alarm input and (2) alarm output.
  25. Operating Conditions: -22 to 122 degrees F; 10 to 100 percent RH.
  26. Security: Password protection, IP address filtering, HTTPS encryption, IEEE 802.1x network access control.
  27. Power: 24 to 28 VDC max 18W; power over Ethernet IEEE 802.3at.
  28. Accessories: Mounting plate, smoke transparent cover. Provide ceiling, pendant, recessed housing, or wall bracket mounting and connector kits.
  29. Basis of Design: Indoor/Outdoor, Axis #P5655-E.
  30. Alternate manufacturers:
    - a. Hanwha Techwin #XNP-9250
    - b. March Networks #SE2
- D. Indoor, 360-degree panoramic (fisheye) view, fixed dome camera shall be 12 mega pixel, network type with WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet (PoE). The camera shall meet or exceed the following requirements:
1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  2. Include a vandal proof resistant casing with smoked transparent cover.
  3. Equipped with pixel counter.
  4. Image Sensor: 12 MP (4000 x 3000), 1/2.3-inch progressive scan RGB CMOS.
  5. Lens:
    - a. 1.2 mm, F2.2
    - b. Horizontal field of view: 182 degrees
    - c. Vertical field of view: 182 degrees
    - d. Fixed iris, fixed focus, IR corrected.
  6. Day and night: Automatically removable infrared-cut filter.
  7. Minimum Illumination:
    - a. Color: 0.19 LUX @ 50 IRE, F2.2
    - b. BW: 0.04 LUX @ 50 IRE, F2.2
  8. Camera angle adjustment: Digital roll: ±180 degrees.
  9. Shutter speed: 1/8,100s to 1/2s
  10. Video compression: H264 (MPEG-4 part 10/AVC), baseline, main and high profiles, H265 (MPEG-H Part2).
  11. Resolutions:
    - a. Overview: 2992x2992 to 160x160 (1:1)
    - b. Panorama: 3840x2160 to 192x72 (8:3, 16:9 or 32:9)
    - c. Double panorama: 3584x2688 to 384x288 (4:3 or 16:9)
    - d. Quad view: 3584x2688 to 384x288 (4:3 or 16:9)

- e. View area 1-4: 2048x1536 to 256x144 (4:3 or 16:9)
  - f. Corner left/right: 3200x1600 to 192x72 (2:1 or 8:3)
  - g. Double corner: 2880x2880 to 384x288 (1:1 or 4:3)
  - h. Corridor: 2560x1920 to 256x144 (4:3 or 16:9)
12. Frame rate:
    - a. 360° overview, only up to max. resolution without WDR: 30 fps @ 60 Hz
    - b. 360° overview and 4 dewarped views up to max. resolution with WDR: up to 20 fps @ 60 Hz.
  13. Video Streaming: Multiple, individually configurable streams in H264, H265, and Motion JPEG.
  14. Multi-view streaming: 360° overview, dewarped panorama, corridor, corner left/right and quad views.
  15. Pan/Tilt/Zoom: Digital PTZ of view areas, digital PT of panorama, corner, corridor, and quad views, preset positions, guard tour.
  16. Support Power over Ethernet according to IEEE802.3at.
  17. Support both IPv4 and IPv6.
  18. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
  19. Be equipped with 1 alarm input and 1 alarm output.
  20. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
  21. Be supported by an open and published API.
  22. Casing: IK08 impact resistant aluminum and plastic casing with polycarbonate hard-coated dome.
  23. Processor and Memory: ARTPEC-8, 2048 MB RAM, 8192 MB Flash.
  24. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
  25. Power: 24 to 34 VDC, max 5.1 Watts, PoE (IEEE802.3af) class 2.
  26. Operating Conditions: 32 to 104 degrees F, Humidity 10 to 85 percent RH (condensing).
  27. Accessories: Mounting plate, vandal casing. Provide ceiling pendant and recessed housing where indicated.
  28. Basis of Design: Axis #M4328-P.
  29. Alternate manufacturers:
    - a. Hanwha Techwin #QNF-9010

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**NOTE TO SPECIFIER**

*Outdoor, 180-degree panoramic cameras are to be utilized for exterior wall mounted applications requiring a large horizontal field of view such as employee parking areas.*

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- E. Outdoor, 180-degree panoramic view, fixed dome camera shall be 13 mega pixel, network type with forensic WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet (PoE). The camera shall meet or exceed the following requirements:
  1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  2. Include a vandal proof resistant casing with smoked transparent cover, fan, and heater.
  3. Equipped with pixel counter.
  4. Image Sensor: 3 x 5 MP, 1/2.8-inch progressive scan RGB CMOS.
  5. Lens:
    - a. Fixed 3.2 mm, F2.0
    - b. Horizontal field of view: 180 degrees
    - c. Vertical field of view: 90 degrees
  6. Day and night: Automatically removable infrared-cut filter.
  7. Minimum Illumination:
    - a. Color: 0.16 LUX, F2.0
    - b. BW: 0.05 LUX, F2.0
  8. Camera angle adjustment:
    - a. Pan: ±180 degrees

- b. Tilt: 0 degrees to 50 degrees.
  - c. Roll: ±5 degrees.
  - 9. Shutter speed: 1/91000s to 1/25s with WDR at 1/50000 to 1/25s.
  - 10. Video compression: H264 (MPEG-4 part 10/AVC), baseline, main and high profiles, H265 (MPEG-H Part 2/HEVC) main profile. Motion JPEG.
  - 11. Resolutions: 5120 x 2560 (13.1 MP) to 256x128.
  - 12. Frame rate: 13.1 MP @ 30 fps (60 Hz) WDR.
  - 13. Video Streaming: 13.1 MP: 1 configurable stream in H.264, H.265, and Motion JPEG in full frame rate.
  - 14. Support Power over Ethernet according to IEEE802.3at.
  - 15. Support both IPv4 and IPv6.
  - 16. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
  - 17. Be equipped with 1 alarm input and 1 alarm output.
  - 18. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
  - 19. Be supported by an open and published API.
  - 20. Casing: Outdoor, IP66/IP67 and NEMA 4X rated, IK10-rated impact resistant casing with polycarbonate hard-coated dome, aluminum base and dehumidifying membrane.
  - 21. Processor and Memory: ARTPEC-7, 2048 MB RAM, 512 MB Flash.
  - 22. Connectors: RJ45 1000 BASE – T with terminal block for two configurable supervised inputs/digital outputs (12 VDC output, max load 50 mA), 3.5mm analog/digital mic/line in.
  - 23. Power: Camera with built-in fan and heater, 24 to 34 VDC, max 12.95 Watts, PoE (IEEE802.3af) class 3.
  - 24. Operating Conditions: -40 to 122 degrees F, Humidity 10 to 100 percent RH (condensing).
  - 25. Accessories: Outdoor, weather shield, cable shield, 16-foot network cable with pre-mounted gasket. Provide pole attachment, pendant, and recessed housing where indicated.
  - 26. Basis of Design: Axis #P3818-PVE.
  - 27. Alternate manufacturers: Hanwha Techwin #XNF-9010RV.
- F. Outdoor, 360-degree panoramic (fisheye) view, fixed dome camera shall be 12 mega pixel, network type with WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet (PoE). The camera shall meet or exceed the following requirements:
- 1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  - 2. Include a vandal proof resistant casing with smoked transparent cover, fan, and heater.
  - 3. Equipped with pixel counter.
  - 4. Image Sensor: 12 MP (4000 x 3000), 1/2.3-inch progressive scan RGB CMOS.
  - 5. Lens:
    - a. 1.2 mm, F2.2
    - a. Horizontal field of view: 182 degrees
    - b. Vertical field of view: 182 degrees
    - c. Fixed iris, IR corrected, fixed focus.
  - 6. Day and night: Automatically removable infrared-cut filter.
  - 7. Minimum Illumination:
    - a. Color: 0.19 LUX @ 50 IRE, F2.2
    - b. BW: 0.04 LUX @ 50 IRE, F2.2
  - 8. Camera angle adjustment: Digital roll: ±180 degrees.
  - 9. Shutter speed: 1/8100s to 0.5s
  - 10. Video compression: H264 (MPEG-4 part 10/AVC), baseline, main and high profiles, H265 (MPEG-H Part2).
  - 11. Resolutions:
    - a. Overview: 2992x2992 to 160x160
    - b. Panorama: 3840x2160 to 192x72
    - c. Double panorama: 3584x2688 to 512x288
    - d. Quad view: 3584x2688 to 384x288
    - e. View area 1-4: 2048x1536 to 256x144
    - f. Corner left/right: 3200x1200 to 192x72

- g. Double corner: 2880x2880 to 384x288 h.  
Corridor: 2560x1920 to 256x144
- 12. Frame rate:
  - a. 360° overview only, up to 2992x2992 without WDR: 30 fps @ 60 Hz
  - b. 360° overview and dewarped views with WDR: up to 20 fps @ 60 Hz
- 13. Video Streaming: Multiple, individually configurable streams in H264, H265, and Motion JPEG.
- 14. Pan/Tilt/Zoom: Digital PTZ of view areas, digital PT of panorama, corner, corridor and quad views, preset positions, guard tour.
- 15. Support Power over Ethernet according to IEEE802.3at.
- 16. Support both IPv4 and IPv6.
- 17. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
- 18. Be equipped with 1 alarm input and 1 alarm output.
- 19. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
- 20. Be supported by an open and published API.
- 21. Casing: Outdoor, IP66 and NEMA 4X, impact resistant aluminum and plastic casing with polycarbonate hard-coated dome.
- 22. Processor and Memory: ARTPEC-8, 2048 MB RAM, 8192 MB Flash.
- 23. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
- 24. Power: Camera with built-in fan and heater, 24 to 34 VDC, max 12.95 Watts, PoE (IEEE802.3af) class 3.
- 25. Operating Conditions: -40 to 122 degrees F, Humidity 10 to 100 percent RH (condensing).
- 26. Accessories: Outdoor, weather shield, cable shield, 16-foot network cable with pre-mounted gasket. Provide pole attachment, pendant, and recessed housing where indicated.
- 27. Basis of Design: Axis #M4318-PLVE.
- 28. Alternate manufacturers: Hanwha Techwin #XNF-9010RV.

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**NOTE TO SPECIFIER**

*The choice of exterior fixed cameras shall be based on the viewing distance, the size of the area to be monitored and the climate in which the camera is to be mounted. In general, utilize the AXIS #P3267-LVE outdoor, fixed dome type camera for exterior, wall mounted applications and for blue sky applications requiring shorter viewing distances. Applications requiring longer viewing distances and those facilities located in extremely cold climates may require the #P1377-LE box camera with environmental enclosure. Specifier shall include paragraph 2.5 F. for those applications.*

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- G. Exterior fixed camera shall be 4 MP (minimum), outdoor, network type with WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet (PoE). The camera shall meet or exceed the following requirements:
  - 1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  - 2. Include a vandal proof resistant casing with fan and heater.
  - 3. Equipped with pixel counter.
  - 4. Image Sensor: 1/2.7inch progressive scan RGB CMOS.
  - 5. Lens:
    - a. Varifocal 2.8-8 mm, F1.2
    - b. Horizontal field of view: 90 - 38 degrees
    - c. Vertical field of view: 67 - 28 degrees
    - d. IR corrected, C5-mount lens, P-Iris.
  - 6. Day and Night: Automatic IR filter removal in low light conditions.
  - 7. Minimum Illumination:
    - a. Color (HDTV): 0.13 LUX @ 50 IRE, F1.2.
    - b. BW (HDTV): 0.03 LUX @ 50 IRE, F1.2.

8. Shutter speed:
  - a. WDR: 1/33500s to 1/5s.
  - b. No WDR: 1/50,000s to 1/5s
9. Video compression:
  - a. H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles.
  - b. H.265 (MPEG-H Part 2/HEVC), Main Profile.
  - c. Motion JPEG.
10. Resolutions:
  - a. 2592 x 1944 (5 MP)
  - b. 268 x 1512 (4 MP).
11. Frame rate:
  - a. Capture mode 5 MP: 30 fps
  - b. Capture mode 4 MP: 30 fps.
12. Video Streaming: Multiple, individually configurable streams in Motion JPEG, H.264, and H.265.
13. Support Power over Ethernet according to IEEE802.3af.
14. Support both IPv4 and IPv6.
15. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
16. Be equipped with 1 alarm input and 1 alarm output.
17. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
18. Be supported by an open and published API.
19. Casing: Outdoor; IP66, IP67 and NEMA 4X, IK10 impact resistant polymer enclosure and aluminum base with integrated humidifying membrane.
20. Processor and Memory: ARTPEC-7, 1 GB RAM, 512 MB Flash.
21. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
22. Power: Camera with built in fan and heater, 12 to 28VDC, max 25.5 Watts, PoE (IEEE802.3af) class 4.
23. Operating Conditions (extreme cold weather): -40 to 140 degree F, Humidity 10 to 100 percent RH (non-condensating).
24. Accessories: Outdoor, weather shield, cable shield, 16 -foot network cable with pre-mounted gasket. Provide wall mount pole attachment.
25. Basis of Design: Axis #P1377-LE.

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**NOTE TO SPECIFIER**

*The choice of exterior fixed cameras shall be based on the viewing distance, the size of the area to be monitored and the climate in which the camera is to be mounted. In general, utilize the AXIS #P3267-LVE outdoor, fixed dome type camera for exterior, wall mounted applications and for blue sky applications requiring shorter viewing distances. Applications requiring long range (250 feet) viewing distances may require the #Q1786-LE long range, bullet type camera. Specifier shall include paragraph 2.5 H. for those applications.*

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- H. Exterior, long range, bullet type fixed camera shall be 4 MP (minimum), outdoor, network type with WDR, light finder, remote focus and zoom and shall incorporate Power over Ethernet (PoE). The camera shall meet or exceed the following requirements:
  1. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
  2. Include a vandal proof resistant casing with fan and heater.
  3. Equipped with pixel counter.
  4. Image Sensor: 1/1.8" progressive scan RGB CMOS.

5. Lens:
    - a. 4.3 - 137 mm, F1.4 – 4.0
    - b. Horizontal field of view: 60 – 2.3 degrees
    - c. Vertical field of view: 39 – 1.3 degrees
    - d. Autofocus, auto-iris, automatic day/night.
    - e. Optimized IR with 80-meter (262 ft) range
  6. Day and Night: Automatic IR filter removal in low light conditions.
  7. Angle of view: 60 to 2.3 degree horizontal; 39 to 1.3 degree vertical.
  8. Minimum Illumination:
    - a. Color (HDTV): 0.18 LUX @ 50 IRE, F1.4.
    - b. BW (HDTV): 0.04 LUX @ 50 IRE, F1.4.
  9. Shutter speed: 1/100,000s to 2s.
  10. Video compression:
    - a. H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles.
    - b. Motion JPEG.
  11. Resolutions:
    - a. 2560x1400 to 160x120
    - b. Maximum pixel density with 32x optical zoom:
      - 1) 25 m (82 ft): 2551 px/m
      - 2) 30 m (164 ft.): 1275 px/m
      - 3) 250 m (820 ft.): 255 px/m
  12. Frame rate:
    - a. WDR: 30 fps, 60 Hz.
    - b. No WDR: 60 fps, 60 Hz.
  13. Pan/Tilt/Zoom: 32x optical zoom.
  14. Video Streaming: Multiple, individually configurable streams in Motion JPEG and H.264, VBR/ABR/MBR H.264.
  15. Support Power over Ethernet according to IEEE802.3af.
  16. Support both IPv4 and IPv6.
  17. Provide multiple user passwords, support for HTTPS and SSL/TLS and incorporate IEEE802.1X authentication.
  18. Be equipped with 1 alarm input and 1 alarm output.
  19. Include embedded event functionality, which may be triggered by alarm input or by video motion or audio detection.
  20. Be supported by an open and published API.
  21. Casing: Outdoor; IP66, IP67 and NEMA 4X, IK10 impact resistant aluminum with integrated dehumidifying membrane. IK08 impact-resistant glass front window and weather shield.
  22. Processor and Memory: 1024 MB RAM, 512 MB Flash.
  23. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
  24. Power: Camera with built in fan and heater, 20 to 28VDC, max 12.95 Watts, PoE (IEEE802.3af) class 3.
  25. Operating Conditions: -40 to 140 degree F, Humidity 10 to 100 percent RH (non-condensating).
  26. Accessories: Outdoor, weather shield, cable shield, 16 -foot network cable with pre-mounted gasket. Provide NEMA 4, watertight factory, cast aluminum backbox.
  27. Basis of Design: **Axis #Q1786-LE.**
- I. Products shall utilize internal or external surge protection such that a normally occurring power surge shall not void any manufacturer’s warranty.
- J. Product model numbers indicated with the cameras are for convenience only. Errors or obsolescence shall not relieve the furnishing of cameras, which meet the technical description given in specifications noted or required by function designated. Cameras of equal or better specifications shall be provided for those cameras found to be discontinued by the manufacturer.



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**NOTE TO SPECIFIER**

*Primary security CCTV monitoring stations shall be equipped with single 50 inch wide video monitors. Satellite secondary security CCTV monitoring stations shall be equipped with single 27 inch wide monitors.*

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**2.6 VIDEO MONITORS**

- A. Provide 27-inch LCD flat-panel color monitor(s) with the following minimum capabilities.
  - 1. Product Requirements:
    - a. Video Interface Connections: HDMI – 1 in, display port in
      - 1) Switching between inputs shall be performed using a front panel control.
      - 2) Resolution shall be equal to the native resolution of the installed Network Video Recorder, if applicable.
    - b. Input Power: 120VAC, 60Hz (a power adaptor may be used to provide this voltage).
    - c. Mounting: Each monitor shall be wall or desktop mounted. VESA mounting holes shall be provided and a series of optional VESA compliant mounts shall be made available at extra cost.
    - d. Operating Temperature: Range shall be equal to or greater than 50 to 104 degrees Fahrenheit.
    - e. Humidity: Withstand a minimum of 10% to 80% humidity.
    - f. Resolution: 1920 x 1080 FHD.
    - g. Pixel Pitch: 0.3114x0.3114 mm.
    - h. Brightness: 250 nits (typ.) 200 nits (min).
    - i. Contrast Ratio: 1000:1.
    - j. Panel Type: IPS.
    - k. Panel Aspect Ratio: 16:9.
    - l. Warranty: 3 years – parts/labor.
    - m. Adjustments: Must support on-screen display for setup and adjustment of monitor parameters.
    - n. Colors: Must support a minimum of 16.7 million colors.
    - o. Basis of Design: Samsung #F27T450FQN.
    - p. Alternate Models: Dell #P2722H
- B. Provide 50-inch LCD flat-panel color monitor(s) with the following minimum capabilities.
  - 1. Product Requirements:
    - a. Video Interface Connections: HDMI – 1 in, display port in
      - 1) Switching between inputs shall be performed using a front panel control.
      - 2) Resolution shall be equal to the native resolution of the installed Network Video Recorder, if applicable.
    - b. Input Power: 120VAC, 60Hz (a power adaptor may be used to provide this voltage).
    - c. Mounting: Each monitor shall be wall or desktop mounted. VESA mounting holes shall be provided and a series of optional VESA compliant mounts shall be made available at extra cost.
    - d. Operating Temperature: Range shall be equal to or greater than 0 to 40 degrees Celsius.
    - e. Humidity: Withstand a minimum of 10% to 80% humidity.
    - f. Resolution: UHD (3840x2160).
    - g. Pixel Pitch: 0.285375x0.285375 mm.
    - h. Brightness: 300 cd/m<sup>2</sup>.
    - i. Contrast Ratio: 4000:1.
    - j. Panel Type: LED BLU.
    - k. Warranty: 3 years – parts/labor.
    - l. Adjustments: Must support on-screen display for setup and adjustment of monitor parameters.
    - m. Colors: Must support a minimum of 16.7 million colors.

- n. Basis of Design: Samsung #QE50T.
  - o. Alternate Models:
    - 1) Dell #C5522QT.
- C. Provide a wall mounted UPS unit at each monitor station location.
1. The UPS shall be line-interactive, rated 1000VA/900W with (18) minute battery reserve at 450 Watts; Tripp-Lite #SMART1000RMXL2U and #2POSRMKITWM wall bracket.

## 2.7 CAMERA POWER SUPPLIES

- A. Interior Fixed Cameras: Camera shall be powered by PoE from network switch. Maximum total cable length (including horizontal and vertical distances) from switch to camera is 300 feet. Provide fiber cabling for cable runs exceeding 300 feet.
1. Network switch shall be equipped with UPS power supply.
- B. Interior and Exterior PTZ Cameras (non "Blue Sky"): Camera shall be powered by PoE from network switch. Maximum total cable length (including horizontal and vertical distances) from switch to camera is 300 feet. Provide fiber cabling for cable runs exceeding 300 feet.
1. Network switch shall be equipped with UPS power supply.
- C. Exterior Building Wall Mounted Fixed Cameras (non "Blue Sky"): Camera and enclosure shall be powered by PoE from network switch. Maximum total cable length (including horizontal and vertical distances) from switch to camera is 300 feet. Provide fiber cabling for cable runs exceeding 300 feet.
1. Network switch shall be equipped with UPS power supply.
  2. Camera enclosures shall be equipped with integral heaters and defoggers.
  3. All exterior building wall mounted cameras are to be considered as "non blue sky" type.
- D. Exterior Cameras ("Blue Sky"): Exterior cameras mounted remote from the building exterior wall are considered "blue sky" type.
1. Wall mounted environmental enclosure power supplies shall be located in a suitably protected area near the camera. Provide individually fused power supplies.
  2. Pole mounted environmental enclosure power supplies shall be located within a NEMA 4 enclosure at the pole. Provide individually fused power supplies.
  3. Camera enclosures shall be equipped with integral heaters and defoggers.
  4. Equip environmental enclosures for exterior cameras with individual 120 VAC / 12 VDC power supplies when required.
- E. Cameras requiring cable runs more than 300 feet and all exterior cameras not building wall mounted and exposed to the elements ("blue sky" type) shall utilize fiber optic transmission equipment and shall be powered by individually fused power supplies.
- F. Provide a means for disconnecting camera power supplies from main power at the power supply enclosure, either through a detachable power cord, master fuse or circuit breaker located in the power supply cabinet, or other UL approved switching device.
1. Provide dedicated 120VAC lockable panelboards as required, located in the Criminal Investigative Office (CIO) to serve all Investigative CCTV cameras. Comply with National Electric Code clearance requirements.
  2. Camera power supplies shall be fed from 120 Volt circuits segregated to serve only the power supplies. Circuits utilized to feed gate controllers, ePACS components or any other non-related loads shall not be utilized to serve the CCTV equipment.
- G. Power supplies shall be rated to support 200 percent of the actual (nominal) power loading and shall be as recommended by the camera manufacturer, equipped with ESD protection for data and video feeds.
- H. Enclosures housing camera power supplies, media converters, fiber patch box and 120 Volt receptacles shall contain interior back planes for mounting of all components. NEMA type 4, stainless steel or non-

metallic polycarbonate, hinged and lockable enclosures shall be provided for exterior applications serving 3 or less pole mounted cameras. CCTV terminal cabinets shall be used to house the components serving more than 3 cameras. Refer to paragraph 2.16.

## 2.8 VIDEO CAMERA HOUSINGS AND MOUNTS

- A. Provide arm brackets, recessed housings, surface mounts, ceiling mounts, pendant kits and surface conduit back boxes as required for all camera types with the following minimum capabilities:
1. Interior Cameras:
    - a. All cameras shall be in a housing that is coordinated with adjacent finishes with the appropriate mounting hardware. Selection of housings and mounts, including incremental changes to paint colors, dome materials, and cosmetic finishes shall be approved by the USPS or their authorized agent.
    - b. All housings shall be sufficiently dust and moisture resistant to withstand normal environmental conditions in their chosen installation location.
    - c. Hardware shall be provided to ensure tamper-resistant mounting in public access areas after normal business hours without modification to the integrity of the housing.
    - d. Pendant mounts shall be suitable for use as wall, ceiling, and column mounts. Pendant mounts shall attach to the appropriate camera housing using standard threaded, rigid aluminum (type IMC) pipes. Pipes are to be a minimum of 1-1/2 inch in diameter. Where indicated, furnish, and install 1-1/2-inch pipe to pendant kit at each pendant hung camera (length as required).
    - e. All pendant mounts shall incorporate installer provided safety chain or cable of sufficient endurance to support 2 times the weight of the camera and mounting hardware. Safety chain or cable shall be securely attached to the building structure at one end and to the bottom of the pendant stem at the other end.
    - f. Camera mounts must be bolted or clamped, not welded, to allow simple relocation. If mounting height requires stems of 4 ft. or more, then additional bracing will be required to prevent camera movement.
  2. Exterior Cameras:
    - a. Environmental: Thermostatically controlled heaters and blowers with defrosting capabilities.
    - b. Moisture: Rainproof seals and gaskets.
    - c. Wind Resistance: Rated for 80mph sustained winds, minimum.
    - d. Ambient Temperature Rating: -22 to 131 degrees F.
    - e. Areas with more demanding environmental conditions will be granted a deviation from this specification.
    - f. Exterior building mounted cameras shall be provided with surge protection at the camera and at the node or headend location.
    - g. All exterior housings, mounts and components including arm brackets, pole mounting kits, cabling, connectors, seals, etc. shall be rated NEMA 4 watertight. Provide factory termination kits and seals.

## 2.9 FIBER OPTIC MEDIA CONVERTER MODULES

- A. Provide fiber optic transmitters, receivers and associated power supplies as recommended by the camera manufacturer.
- B. Fiber optic transmission equipment shall be used when one or more of the following conditions are met:
1. Camera cable lengths (including horizontal and vertical distances) exceed 300 linear feet.
  2. The camera is located outdoors, is not building wall mounted and is exposed to the elements ("blue sky" type).
    - a. Building wall mounted cameras and any cameras protected by canopies or other architectural elements that shield them from direct view of the overhead sky are excluded from this requirement.

3. Cabling from the remote node cabinets to the CCTV headend.
  4. The cable path is within 20 feet of a TIME or MIMS aerial.
- C. Fiber transmitters and power supply modules located at field devices shall be low profile “miniaturized” type and shall be mounted in the NEMA 1 (indoor) or NEMA 4 (outdoor) enclosures containing the PoE Injectors for both fixed and 360-degree panoramic (fisheye) cameras.
1. AC power is required for the transmitter power supply and PoE injector.
  2. The power cords shall be 24 inches long to avoid large cable bundles within the enclosures.
- D. Fiber receiver modules located at the node or head-end locations shall be rack mounted.
1. If more than one fiber optic rack is used, modules shall be distributed as evenly as possible among the racks to reduce the load on the rack power supply and minimize the impact of a failed rack.
- E. Fiber optic modules shall conform to the following minimum specifications:
1. 10/100 MBps RJ45 Ethernet port, LC Fiber Port.
  2. 50/125, OM3, tight-buffered, multimode fiber.
  3. PoE (PD) device or locally powered.
  4. Protocol independent.
  5. -31 to 158 deg operating Temperature.
  6. IEEE 802.3, IEEE 803.2u and IEEE 803.2af Complaint.
- F. Patch Cables
1. Provide fiber optic patch cables for patched connections within the node cabinets and NEMA 1/NEMA 4 fiber enclosures.
- G. Alternate manufacturers: As listed in paragraph 2.1A.

## 2.10 REMOTE NODE CABINET

- A. Remote Node Cabinet shall be 25-inch W x 42-inch H x 12 inch D, lockable and shall house an IP video system network switch, category 6 and fiber patch panels, fiber media converters, surge protectors, midspan injectors, plug-in strips, UPS and camera power supplies and accessories as indicated on the drawings.
1. Basis of Design: **Great Lakes #DC07844A** with forced fan ventilation.
  2. Alternate Manufacturer: **Middle Atlantic #VWM-4-5-42K-PW.**
  3. Supply 1000VA/900W, line-interactive, rack mounted UPS with 18-minute battery reserve rated at 450 Watts. Tripp-Lite **#SMART1000RML2U.**
  4. Provide (2) eight position, 15 Amp, plug-in power strips and feed from a dedicated 20 Amp, 120 Volt circuit for each remote node cabinet.
- B. Remote node cabinets shall be mounted high enough to deter unauthorized tampering, but low enough to avoid the use of motorized lifts for future repair or warranty work.
1. Node cabinets mounted within ePACS secured rooms shall typically be wall mounted top at 6 feet AFF.
  2. Node cabinets mounted within the workroom and platform areas must be wall or column mounted bottom at no less than 9 feet AFF and no more than 14 feet AFF.
- C. Interior cable runs from remote node cabinets to the CCTV headend rack shall be (6) count, OM3, interlocked armor, tight buffered, multi-mode, plenum rated indoor fiber cable (**Superior Essex #L4006N401**). Note that armor jacketed fiber cabling need not be contained within innerduct or conduit.
- D. Each remote node cabinet containing surge protection devices shall be bonded to the overhead building steel or to the nearest telecommunication ground bar (TMG). Provide copper ground bus (Square “D” **#PK27GTACU** with compression lugs or equal) within these node cabinets and bond to building steel or “TGB” utilizing **#6/THWN/CU/GRND** conductor.

## 2.11 MIDSPAN INJECTORS / ETHERNET CABLE EXTENDERS

- A. Provide Ethernet Midspan Injectors as required and recommended by the camera manufacturer.
- B. When adding or replacing cameras to an existing CCTV system, camera total cable lengths (including horizontal and vertical distances) more than 300 feet and no more than 800 feet may be equipped with Ethernet cable extenders.
- C. All camera cable runs exceeding 300 feet shall be fiber optic.
- D. Modules located at the cameras shall be located within a properly sized junction box mounted near the camera. Field device modules require local 120 Volt power.
  - 1. The power cords shall be 24 inches long to avoid large cable bundles within the enclosures.
- E. Midspan injectors located at the head-end and node cabinets are standalone modules rack mounted within the equipment rack.
- F. Basis of Design: **Axis 30W Midspan.**
- G. Alternate manufacturers:
  - 1. Hanwha Techwin
  - 2. March Networks.

## 2.12 CABLING

- A. Cabling requirements:
  - 1. Interior cable runs from cameras to node cabinets or to the CCTV headend that do not exceed 300 feet shall be category 6 (purple in color); plenum rated.
  - 2. Interior cable runs exceeding 300 feet from cameras to node cabinets or to the CCTV headend shall be 2 count OM3, interlocked armored, tight buffered, multimode, plenum rated indoor fiber cable.
  - 3. Exterior cable runs routed to remotely located "blue sky" cameras shall be 2 count, OM3, non-armor jacketed, tight buffered, multi-mode, indoor/outdoor, plenum rated fiber cable. Multiple strand fiber cabling (6 or 12 strand) may be utilized to serve more than one camera provided (2) strands are dedicated for each camera.
  - 4. Interior cable runs from remote node cabinets to the CCTV headend rack(s) shall be 6 count, OM3, interlocked armored, tight buffered, multi-mode, plenum rated indoor rated fiber cable. Note that armor jacketed fiber cabling need not be contained within innerduct or conduit.
  - 5. All exterior category 6 and fiber cable runs shall be contained in conduit or an approved raceway.
- B. Camera Ethernet Data Cabling:
  - 1. 4-Pair Category 6, plenum rated unshielded twisted pair cable (purple in color).
  - 2. Provide and install the RJ45 male jack with coupler jack module attached at the camera end and RJ45 male jack at the patch panel end of each cable as indicated in paragraph 3.2 G.
    - a. Basis of Design: **Belden #AX104210** (coupler jack).
    - b. Acceptable Alternate Manufacturer: **ICC #IC107CP6BK** (coupler jack).
  - 3. Category 6 cable shall be terminated utilizing male RJ45 jacks on both ends of the cable to facilitate cable testing prior to installation of the node cabinets or headend. All testing shall be performed only after the cables have been terminated with the male RJ45 jacks.
  - 4. Complies with individual characteristics established in ANSI/TIA/EIA-568-B terminated to T568A and all addendums for Category 6 cable performance specification.
  - 5. Cabling and wire ways shall be installed in accordance with section 260533.
  - 6. Final category 6 cabling routed from the pole mounted NEMA 4 enclosures and the terminal cabinets, serving the "blue sky" cameras and the patch cords utilized within the exterior enclosures and cabinets, shall be "outside plant (OSP)" rated, gel-filled, direct burial type.

- C. Power cable shall be appropriately sized to ensure that any signal loss as a function of cable length does not prohibit the delivery of sufficient voltage and current from the power supply to the powered device. A separate power cable may be required by the design engineer as shown on the drawings.
- D. Cable shall have footage markings to Identify CCTV system cable lengths.
- E. Fiber Optic - When fiber optic modules are required, provide fiber optic cable appropriate for the application. Cable shall conform to the following specifications:
  1. OM3, interlocked armored, tight buffered, multimode, plenum rated indoor fiber.
  2. OM3, non-armor jacketed, tight buffered, multimode, indoor/outdoor, plenum rated fiber.
  3. "LC" type connectors shall be used on all cable terminations, including junction boxes and break-out trays.
  4. Performance characteristics (including optical attenuation) shall be such that the fiber optic modules specified in Section 2.9 function to deliver signals end-to-end with sufficient bandwidth and quality to meet the specified application.
  5. Physical characteristics such that the cable has sufficient strength and endurance to withstand installation and environmental conditions without adversely affecting optical performance.
  6. At no time shall fiber optic cable have loose ends terminated and left loose. All fiber optic cable shall be looped, stored, connected, and permanently mounted in appropriate LIU cabinets/devices prior to testing. All fiber cabling shall be terminated utilizing factory manufactured fan-out kits.
  7. Fiber cabling not armor jacketed and routed within interior spaces shall be encased within appropriately sized plenum rated, innerducts.
  8. Terminate and test the fiber optic cable and connectors.
  9. Fiber distribution, patch boxes (interconnect centers) shall be provided within the NEMA 4 enclosures at the pole mounted, blue-sky type cameras for termination of the fiber cabling.
    - a. Provide (6) port fiber patch box complete with adapter plate, "LC" connectors, splice tray, protection sleeves, fan-out kit and enclosure.
      - 1) Basis of Design: RLH Industries #PWSN-A-56-63-1 (Slimline patch panel: 4-inch W x 5 1/2-inch H x 2 inch D.
      - 2) Alternate U.S. manufacturers permitted.
  10. Fiber cabling shall be well managed and protected and never directly connected to any camera device or component.
  11. Fiber patch boxes (interconnect centers) shall be equipped with covers, so the fiber strands are not exposed.
  12. Cap all unused fiber ends to maintain cleanliness and avoid physical damage; all fiber strands are to be terminated.
  13. Clean out any metal shavings or other debris from the enclosure.
  14. Do not run fiber strands through any brackets or around other cables.
  15. Label each fiber cable with to/from destination. Attach a panel label to the inside of the patch panel cover.
  16. Allow access to optical fiber cabling for testing.
  17. Protect connections against accidental contact with foreign objects that may disturb optical continuity.
  18. Properly handle optical fiber cables and patch cords and promote their orderly management.
  19. A fiber optic service loop of sheathed fiber no less than 20 feet at each end shall be installed at each termination point. All service loops shall be installed so that the minimum bend radius (10 times the outside diameter of the fiber) is maintained and shall be installed outside of the fiber optic termination housing. Once the fiber reaches the entrance point of the fiber optic patch panel, there shall be no less than 3 feet of unsheathed fiber installed neatly in the fiber optic storage tray prior to terminations being installed. Unsheathed fiber shall be installed in the storage tray per the fiber optic enclosures manufacturer's instructions.

Cable Type	Signal	Use
(2) Count, OM3, interlocked armored, tight buffered, multimode, indoor plenum rated fiber cable (Superior Essex #L4002N301 or Approved	Camera Data	Interior camera cable runs exceeding 300 feet. See Sections 2.9 and 2.14

Equal)		
(6) Count, OM3, interlocked armored, tight buffered, multimode, indoor plenum rated fiber cable (Superior Essex #L4006N401 or Approved Equal)	Data	Interior cable runs – node cabinets to headend. See Sections 2.9 and 2.14
(2) Count, OM3, non-armor jacketed, tight buffered, multimode, indoor/outdoor, plenum rated fiber optic (Superior Essex #W4002NG01 or Approved Equal)	Camera Data	Exterior cable runs to “blue sky” cameras. See Sections 2.9 and 2.14
Category 6 plenum rated cable with footage markings (purple) (Superior Essex #77-240-7B or Approved Equal)	Camera Data	Interior camera cable runs less than 300 feet. See Section 2.13
Category 6 “OSP” rated cable with footage markings (black) (Superior Essex #04-001-68 or approved equal)	Camera Data	Exterior final cable runs (50 feet maximum) to cameras. See Section 2.13.

## 2.13 CATEGORY 6 CABLING

- A. Manufacturers: Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the work include the following:
1. Belden
  2. Berk-Tek
  3. CommScope Uniprise
  4. General Cable
  5. Leviton
  6. Ortronics (Legrand)
  7. Panduit
  8. Superior Essex
  9. Product options and substitutions. Substitutions: Permitted if approved by the A/E and Manufacturer.
- B. Conductors: 4 twisted pair, minimum 23 AWG, solid copper.
1. Individually insulated plenum rated conductors under common plenum rated sheath. Provide outdoor, “OSP” rated cable and patch cords for exterior applications.
  2. Complies with individual characteristics established in TIA-568-C, and all addendums for Category 6 cable performance specification.
  3. Nominal Impedance: 100 ohms plus or minus 15 percent.
  4. Certified and capable of performing to a minimum of 250 MHz
  5. Maintain manufacturer’s twisting of wire pairs to termination point. Do not attempt to restore, modify, or add to manufacturer’s twisting of cable. Do not untwist more than ½ inch of the stripped cable.

## 2.14 OM3 FIBER CABLING

- A. Manufacturers: Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
1. Belden
  2. Berk-Tek
  3. CommScope Uniprise
  4. Corning Cable Systems

5. General Cable
6. Leviton
7. Optical Cable Corp.
8. Ortronics (Legrand)
9. Superior Essex
10. Product options and substitutions. Substitutions: Permitted if approved by the A/E and Manufacturer.

B. Conductors: 2 / 6 strand

1. Provide multi-strand, 50/125-micron, laser optimized, tight buffered, multimode, OM3 fiber cabling rated as follows:
  - a. 1 Gb/s  $\leq$  1000m @ 850 nm.
  - b. 1 Gb/s  $\leq$  600m @ 1300 nm.
2. The fiber cabling shall meet the following specifications:
  - a. TIA/EIA-455-78, ANSI/TIA-455-176-A-2003, "Detail Specification for 50-micron Core Diameter/125 micron Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers."
3. Terminate fiber strands onto "LC" ports.
4. Provide individually insulated plenum rated strands under common plenum rated sheath.
5. Fiber cabling shall comply with individual characteristics established in TIA-568-C including all addendums for fiber optic cable performance specification.
6. Interior fiber cabling shall be indoor rated and interlocked armor jacketed.
7. All exterior and underground fiber cable shall be indoor/outdoor, plenum rated. Provide indoor/outdoor, "OSP" rated, fiber patch cords for exterior applications.

## 2.15 SECONDARY BONDING BUSBAR – SBB BEHIND HEADEND

- A. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
  1. Harger – P/N GBI/14212 G
  2. Chatsworth
  3. Legrand
  4. Product options and substitutions permitted if approved by the A/E.
- B. Provide and install one SBB behind the CCTV headend rack(s), below ceiling acoustic tile, with all bonding leads clearly labeled by machine labeler. All bonding leads shall be 2-hole compression lugs. This SBB will connect to the nearest telecommunication or electrical system grounding electrode ground bar using minimum #1/0/AWG/CU bonding conductor. Minimum size will be 2-inch H x 0.25-inch W x 12-inch L.
- C. Each headend rack shall be bonded to the SBB using a #6/AWG/CU stranded bond wire.
- D. Each (2) lug compression connector shall have antioxidant coating applied to lug and busbar prior to attachment.

## 2.16 ACCESSORIES

- A. Lightning/Surge Protection: Products shall utilize internal or external (power and low voltage) surge protection such that a normally occurring power surge shall not void any manufacturer's warranty.
  1. Rack mounted surge protectors shall be provided within the headend and remote node cabinets to protect the category 6 cabling serving the exterior, building wall mounted cameras. Modular surge protectors shall also be provided at the camera end of the category 6 cable.
- B. The headend equipment racks shall house the IP video system network switches, NVR's, category 6 and fiber patch panels, fiber media converters, surge protectors, midspan injectors, laptop computer, plug-in power strips, power supplies, necessary accessories and utilize a standalone UPS. Provide dedicated 30 Amp, 120VAC power and NEMA L5-30R twist-lock receptacle.
  1. The UPS shall be line-interactive, rack mounted and rated 3kVA/2.88kW with a 10-minute battery reserve at 1440 Watts; Tripp-Lite #SMART3000RML2U.
  2. Provide (2) vertical mounted, sixteen position, 20 Amp, plug-in power strips within each rack.



3. Provide tri-plex Telecommunications Outlet (T/O) bottom mounted at 24-inch AFF behind the headend rack.
- C. Upright Racks: Provide and install appropriate number of 25-inch W x 72-inch H x 36-inch D, enclosed, upright equipment racks to provide sufficient mounting space for the required equipment.
1. Racks shall be all metal construction conforming to EIA standards with 19-inch equipment mounting opening and 1-3/4" vertical spacing of equipment. Rack rails shall be punched with captive nuts, 10-32 screws and nylon washers.
  2. Basis of Design:
    - a. Great Lakes #GL7202436 – Diebold4 with forced fan ventilation and rolling casters.
    - b. Product substitutions not permitted.

## 2.17 CCTV TERMINAL CABINETS

- A. CCTV terminal cabinets are typically used to house the fiber media converters and injectors serving more than (3) exterior pole mounted cameras. CCTV terminal cabinets shall be utilized to serve pole mounted cameras located no more than 50 feet (horizontally) from the cabinet. Underground runs of category 6/OSP/Wet cables serving pole mounted cameras more than 50 feet from the terminal cabinets are not permitted. Cameras located more than 50 feet from the terminal cabinets must utilize fiber cabling and pole mounted, NEMA 4 enclosures to avoid the increased risk of lightning induced transients.
- B. CCTV terminal cabinets shall not contain ePACS components. The CCTV system shall utilize independent wiring, raceways, and cabinets.
- C. Terminal cabinets shall be provided to house media converters, mid-spans, power supplies, SPD's and other CCTV system components. Enclosures shall be hinged and lockable with panelboard construction and plywood backboards.
- D. Terminal cabinets shall be wall or pedestal mounted with bottom of cabinet at no less than 12 inches. **A.F.F. or A.F.G. Provide NEMA type 1 enclosures within interior locations and NEMA type 4 (watertight) stainless steel or non-metallic polycarbonate type for exterior locations. Pedestal mounted cabinets shall be supported utilizing 4-inch square concrete posts buried 24 inches below finished grade and set in concrete footing with 6 inches of concrete all around.**
- E. Terminal cabinets shall be amply sized to accommodate all components without overheating and forced air exhaust fans shall be provided. Cabinets requiring 120 Volt power shall be provided with appropriate number of 20 Amp, 125 Volt receptacles complete with surge protection. Receptacles shall be securely mounted within the cabinet.
1. Components shall be individually mounted and secured to the backboard. Stacking of components is not acceptable and the use of tie-wraps is prohibited.
- F. Exterior terminal cabinets mounted near or adjacent to vehicular traffic shall be protected using 6-inch dia. x 4 - foot high concrete bollards. Exterior terminal cabinets shall be located within the secured area of the facility.
- G. Exterior terminal cabinets shall be equipped with a copper ground bus bonded to a driven ground rod using #2/AWG copper grounding electrode conductor.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Section 017300 - Execution: Verification of existing conditions before starting work.
- B. Verification of Conditions: Verify that field measurements, surfaces, substrates, and conditions are as required, and ready to receive work.
  - 1. Verify that power and video outlets are in correct locations.
  - 2. Verify that building structure for attachment of equipment mounting devices is in place.
- C. Report in writing to the USPS Project Manager any prevailing conditions that will adversely affect satisfactory execution of work of this section. Do not proceed with work until unsatisfactory conditions have been corrected.
- D. By beginning work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Postal Service.
- E. Provide required power outlets, low voltage power supplies, interconnecting cables, hardware, and equipment for a complete and operable system.
- F. Camera locations are to be reviewed and approved by a Postal Inspector and/or OIG, through the USPS Project Manager, prior to installation of conduit and cabling.

### 3.2 INSTALLATION

- A. Install all equipment in accordance with Manufacturer's published instructions. Installation must be done by a Manufacturer Certified Installer to assure proper installation and accountability. This includes, but is not limited to the following:
  - 1. All hardware used to secure equipment to racking shall include nylon or other non-metallic washer or grommet between the screw head and equipment panel to prevent any damage to the equipment.
    - a. Rack mount screws shall be self-centering, Philips-head configuration unless specialized tamper-resistant hardware has been specified.
    - b. Screws shall be tightened in such a manner as to allow their removal with common hand tools.
  - 2. Any equipment placed on shelving mounted on an incline of greater than 2 degrees shall be secured to the rack or shelving in such a manner as to prevent movement of the equipment in the direction of the incline. Such fastening shall be done in a manner as to preserve the integrity of the equipment case and chassis and shall in no way jeopardize warranty coverage of the device.
  - 3. All equipment cabling shall be dressed in such a manner as to ensure a neat and clean appearance.
  - 4. Cable breakouts shall be at 90-degree angles from the harness or chase, and all chases shall be parallel to or at 90-degree angles from the rack frame.
  - 5. Cables are to be secured to the rack frames at sufficient intervals to ensure that the weight of the cable will not contribute to fatigue or early failure of that cable or the device and connector to which it is attached.
  - 6. Sufficient excess cable shall be provided in "service loop locations" to ensure that the cable may be re-connected without requiring the addition of extension pieces. Provide 20-foot, coiled service loops at the camera and headend/node termination points.
  - 7. All permanent cabling shall be mechanically numbered in a manner consistent with the written system documentation.
  - 8. All wiring to include category 6 and fiber optic cables shall utilize hook and loop fasteners to eliminate the risk of over-tightening cable bundles and affecting the strength or rated performance of the cable. The use of tie wraps is not acceptable.
  - 9. Where wiring is routed through sheet metal or over frame members, the metal edges shall be covered with flexible grommeting or edge dressing (such as automobile door edge trim).

10. Double-sided foam tape shall not be used to secure any equipment, terminal blocks, or accessory devices. All device mounting shall be of a permanent nature.
  11. All excess length AC cords are to be tie-wrapped out of the way. Where possible, they shall be routed in a separate bundle a minimum of 6 inches away from any signal or control cable.
  12. Exposed wires run to wall mounted cameras shall be fed through tubing or the body of the mount to present a professional appearance.
    - a. Any accessible cables that can be reached by an individual standing on the floor, a stool, or a small stepladder shall be encased in protective tubing or armored sheathing to prevent tampering or cutting with common hand tools.
  13. Care shall be exercised at all times to protect Postal Service property. For example, ladders shall not be placed against wallpapered or finished surfaces, equipment, or furnishings; desks or countertops shall not be used in lieu of ladders.
  14. Each camera shall be labeled by a numbering system requiring no more than three digits. Use the camera numbering system as shown on the Drawings to provide a consistent, matching, and accurate as-built documentation.
    - a. Each pendant or arm mounted, PTZ camera shall be labeled on three sides with 3-inch-high numbers.
    - b. Each ceiling, wall or pendant mounted, 360-degree panoramic camera shall be labeled on three sides with 1-inch-high numbers.
    - c. Each ceiling, wall or pendant mounted, fixed camera shall be labeled on two sides with 1- 1/2-inch-high numbers.
    - d. The outer shroud of each wall or pole arm mounted, fixed or 180-degree panoramic camera shall be labeled on two sides with 2-inch-high numbers.
    - e. The flange of each recessed ceiling mounted PTZ, fixed or 360-degree panoramic camera shall be labeled on two sides with 1-inch-high numbers.
    - f. Labeling shall be stenciled or laminated vinyl in a contrasting color to the camera housing.
    - g. Labeling shall not be placed on lower dome or any area that would obstruct camera viewing.
  15. Ensure that pendant mounted cameras are hung from stable, vibration free mounting platforms, using guidewires or other support mechanisms to ensure stability where required. Mount cameras below any suspended lighting to avoid glare or reflection on camera dome and/or lens.
  16. Perform complete programming of the system, in coordination with the Postal Inspector and USPS Project Manager or designated representative. Programming shall include, but not be limited to, elimination of duplicate or redundant titling information, synchronization of system clocks, camera sequences, dome presets, salvos, and tours. Programming of any system passwords or limiting of accessibility prior to commissioning and training is prohibited.
  17. Provide the "as-built" redlined drawings with job condition changes required to provide accurate close-out documentation.
- B. Power requirements shall be determined by actual equipment used.
- C. Ensure that:
1. All applicable statutes, ordinances, regulations, license requirements and codes are fully complied with.
  2. All required permits are obtained.
  3. All required inspections are conducted.
  4. All necessary certificates are issued, obtained, and delivered to the Postal Service.
  5. All equipment installations and mounting are in strict accordance with requirements for applicable seismic classification.
- D. Arrange all components to be mounted in the console(s)/rack(s) in accordance with the Manufacturer's recommendations and/or Postal Service provided System Elevation drawings. Design shall provide a neat appearance and accessibility for servicing equipment.
- E. Provide required power outlets, interconnecting cables, hardware, and equipment for a complete and operable system.
1. Power, 120VAC: As required by codes and standards for the facility.

2. Where conduit is used, a minimum of 40% excess capacity shall be provided for future use.
  3. All interior conduits shall be EMT with steel set-screw type couplings. All exposed exterior conduits (and interior conduits mounted below 10 feet – 0 inches AFF within the workroom) shall be heavy wall, rigid galvanized steel type.
  4. All concealed and exposed conduit and cabling shall be routed parallel and perpendicular to structural elements. Conduit penetrations through fire rated partitions shall be properly fire stopped.
  5. All cables and conduits shall be routed below the roof decking to avoid damage due to future reroofing. Raceways and cables shall not be routed between the decking flutes.
- F. Install cameras as shown on the drawings and in accordance with the USPS specifications.
1. Provide 84-inch minimum headroom below cameras and their mountings. Where necessary modify mounting type to maintain clearance.
- G. All category 6 cable connections must be made to 8 pin coupler jacks at the device and to 8 pins, feed- thru coupler jack patch panels at the head end or node cabinets per T568A standard.
1. The category 6 CCTV cabling shall be equipped with an RJ45/CAT-6 male jack with coupler jack attached at the camera end ready for final patch cord connection to the camera. The node or headend connection of the cable shall be a CAT-6/RJ45 male jack.
  2. The remote node cabinets and headend rack(s) shall be equipped with feed-thru, coupler jack patch panels to accept the RJ45 male jacks terminated on the camera cabling.
- H. When not installed in cable trays, cable (category 6, fiber optic, and low voltage power) shall be supported with wide base cable hangers rated for proper support of category 6, fiber optic, and inner- duct cables (compliant with UL and NEC requirements for structured cabling).
1. Cable hangers shall be installed every 3 to 6 feet and shall be rated to support the weight of the cable multiplied by a factor of three (3).
  2. Cable tray for camera wiring shall not include any low voltage AC wiring.
  3. Interior fiber optic cabling not equipped with armor jacketing shall be contained within plenum rated innerduct.
- I. The entire CCTV system shall utilize an independent wiring system not shared with any other building system. The structured cabling system racks, the TE's, the fiber backbone, cable trays, etc. cannot be utilized for any CCTV system purpose. Cable trays installed for the CCTV cabling may be utilized to contain the ePACS wiring.

### 3.3 DOCUMENTATION

- A. Provide high-definition photographs showing the interior components of all equipment enclosures, terminal cabinets, remote node cabinets and the headend rack(s). Photographs shall show wiring and placement of the midspan injectors, fiber media converters, surge protectors, fiber patch boxes, power supplies, power strips and receptacles. Photographs shall be transmitted to the A/E and USPS Project Manager.

### 3.4 FIELD TESTING CATEGORY 6 COPPER AND FIBER OPTIC CABLE

- A. Section 014000 – Quality Requirements: Field testing and inspection.
- B. Field Testing Procedures:
1. Provide all equipment and services necessary to test the cabling.
  2. Test and calibrate instruments before testing.
  3. Re-terminate and retest any cable found to be defective.
  4. Perform cable testing and submit report prior to installation of any cameras or node cabinets.
- C. Category 6 Copper Cable Testing:

1. Use Level III Compliant test equipment.
  2. Test parameters shall include:
    - a. Wire map.
    - b. Insertion loss (attenuation).
    - c. DC loop resistance.
    - d. Return loss at camera.
    - e. NEXT, NEXT at camera.
  3. Perform end-to-end tests of each 4-pair cable as follows:
    - a. Pair/conductor for proper pinouts and continuity.
    - b. Ground fault.
    - c. Proper termination, shorts, and crossed pairs.
    - d. Channel attenuation per TIA-568-C, including all addendums.
    - e. Channel bi-directional worst case near end cross talk (NEXT) at frequencies up to 250 MHz, per TIA-568-C, including all addendums.
    - f. Measured effective cable run length.
- D. Fiber Optic Testing:
1. Use 50/125 micron, OM3, multimode fiber optic cable testing.
  2. Perform testing of fiber in accordance with the fiber type being tested, TIA-526-14-A, Method B for Multimode Fiber (One Jumper/Two Adapters).
  3. Multimode fiber optic cable shall be tested bi-directionally at wavelengths of 850nm and 1300nm.
  4. The fiber testers and test heads shall have passed calibration within one year of actual test date.
  5. Tests include:
    - a. Tier 1 Testing with Optical Loss Test Set (OLTS) that includes testing for length.
    - b. Tier 2 Testing with OTDR to show all splices.

### 3.5 CONSTRUCTION COORDINATION

- A. Interface the CCTV installation with Other Work that may be required.

### 3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Inspection and testing procedures.
- B. Inspection:
  1. Inspect equipment installation, interconnection with system devices, mounting locations, and mounting methods.
  2. Verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.
- C. Testing:
  1. Perform tests and provide test equipment, tools, and personnel required to conduct system tests and inspections. These tests shall include video quality and PTZ operation (where applicable) for all cameras.
  2. Conduct system acceptance test upon completion of installation using pre-approved procedures. Test shall consist of system, subsystem, and device level acceptance tests, including software.
  3. Utilize USPS accepted CCTV Checklist for system testing.
  4. Ensure that test procedures confirm each specification statement and manufacturer requirement has been met or exceeded. An actual demonstration of each system function and a simulation of each system failure shall be provided.
  5. An acceptance test period of thirty days shall begin at the start of the acceptance test. Any system failure during the acceptance test period will suspend the acceptance test. The thirty-day test period will restart when the required repairs have been made and certified.
  6. Perform all tests in the presence of the USPIS/OIG Personnel. The USPIS/OIG reserves the right to accept any portion or activate any phase prior to acceptance of entire system.

### 3.7 ADJUSTMENTS

- A. Adjust manual lens irises to meet lighting conditions.
- B. Adjust field of view for each camera per USPIS/OIG direction.

END OF SECTION

SECTION 281304

ENTERPRISE PHYSICAL ACCESS CONTROL SYSTEM (ePACS)

\*\*\*\*\*

**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 3 Specification with primarily required text; therefore, most of the text cannot be edited, but there is editable text which is noted within the Section with a "Note to Specifier." Do not revise the required paragraphs without an approved Deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements. See the "Using the USPS Guide Specifications" document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the "last revised" date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, "USPS MPF SPECIFICATION" with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

***Use this section where an Enterprise Physical Access Control System (ePACS) is part of the Work. Verify ePACS requirements with the USPS Project Manager and US Postal Inspection Service.***

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PART 1 - GENERAL

1.1 SUMMARY

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**NOTES TO SPECIFIER**

*Edit Paragraphs A, B, and C below as needed to coordinate with project scope of work.*

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- A. Section includes specifications for an integrated security management system which shall perform the following general service:
  - 1. Access control.
  - 2. Alarm monitoring.
  - 3. Reporting functions.

4. Security management functions.
  5. Photo-ID badge issuing.
- B. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other documents including:
1. ePACS Standard System Configuration – revised March 2017.
  2. Access Control (ePACS) SOP – revised October 2019.
- C. Related Sections:
1. Section 081100 – Metal Doors and Frames.
  2. Section 087100 – Door Hardware.
  3. Section 111415 – Turnstiles.
  4. Section 260500 – Common Work Results for Electrical.
  5. Section 264128 – Surge Protective Devices (SPD).
  6. Section 270500 – Common Work Results for Communications.
  7. Section 281524 – IP Video Intercom and Exterior Gate Control System.
  8. Section 281600 – Intrusion Detection System.
  9. Section 282305 – Integrated Security and Investigative Platform (ISIP) CCTV System.
  10. Section 283100 – Fire Emergency Voice/Alarm Communication System (EVACS).

## 1.2 SYSTEM DESCRIPTION

- A. Enterprise Physical Access Control System:
1. Access management system (System) shall monitor and control access to areas defined herein.
  2. The system will utilize proximity cards as its primary access device, but will support ISO 14443 Contactless smartcard technology, such as Mifare, and (keypad) technology at each door. It shall also support alarm inputs and control outputs.
  3. System shall consist of computers (servers/workstations), stand-alone microprocessor-based controllers, card readers [and/or keypads] and host software.
  4. The microprocessor-based controllers will be capable of controlling 16 card reader inputs and 16 door outputs. It will also be able to monitor a minimum of 92 alarm points, storing a minimum of 5000 events before downloading to the central computer. It will be able to store a minimum of 10,000 cardholders.
  5. System shall be capable of operating in a distributed processing environment with or without host connectivity.
  6. Specific types of devices and their functions shall be addressed in relevant sections.
  7. The system shall support an integrated electronic photo identification (photo-ID) system.
  8. System will utilize an ODBC compliant database, such that it can share or retrieve information from a local database.
  9. System shall be able to compare its list with the information from the USPS database and flag discrepancies of listed individuals in either database and have the ability to generate a report listing the discrepancies and records.
  10. System will share its database with the electronic photo-ID system to eliminate redundant input of data to the databases for common data fields.
  11. The operating system shall be USPS Windows applicable version (ACE standard operating system).
  12. The system shall support true multi-user, multi-tasking with a minimum of 3 workstations.
  13. The system shall include capability for remote access for off-site support and/or management workstations. Systems that connect to the network must provide remote access via the Postal Service business partner VPN connectivity. Dial-up phone connectivity is not permitted when systems are connected to the network.
  14. The system shall utilize standard GUI interface allowing day-to-day operations to be performed using a standard mouse. All graphics shall be dynamic color alarm graphic maps (user definable) created with graphic drawing programs, not vector files. All device names shall be user programmable (minimum of 32 characters, full English).
  15. The complete operator instruction manual shall be imbedded in the on-line help and shall be

readily accessible using standard "Index," "Help Topics," "Keyword" and "Search" requests.

16. The client shall have the ability to define events for viewing in any one of multiple event viewer screens or any combination of screens. Events shall also be designated for printing to selectable printers.
17. Provide multiple levels of password protected system access with encryption. All passwords will use one-way encryption.
18. Provide operator with configurable reporting of event history and cardholder activity by authorized request only.
19. Provide reports for: Inputs (all or in groups), outputs (all or in groups), alarm messages, instructions, event action, card transaction history, field devices and panel reports, alarm history, alarm suppression.
20. Report generation shall allow for reports to be filtered by time and date as well as by device name, event category and definition and by card holder categories or individual record(s).

B. Description of work:

1. Include all necessary labor, tools, equipment, and ancillary materials required to furnish and install a complete and operational access control and alarm monitoring system.

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**NOTE TO SPECIFIER**

*Review the following lists with the USPS Project Manager and US Postal Inspection Service. Note that coded keypads shall only be utilized upon approved exception by USPS. Modify accordingly.*

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2. Enterprise Physical Access Control System will manage access to the following [building] [and] [selected areas] using [encoded cards.] [and/or] [coded Keypads.]
  - a. Employee entrances/exits.
  - b. Access to administrative space.
  - c. Registry Cage.
  - d. Stamp Depository.
  - e. Vehicular access (employee and USPS maneuvering area).
3. The extent of Enterprise Physical Access Control System work is defined to include, but not by way of limitation:
  - a. ePACS Controllers.
  - b. Reader Interface Modules.
  - c. Card reading sensors.
  - d. Input monitoring modules.
  - e. Output relay modules.
  - f. Wiring, power supplies, switches, and ancillary equipment.
4. Requirements are indicated elsewhere in these specifications for work including, but not limited to, raceways and electrical boxes and fittings required for installation of control equipment and wiring, not the work of this section.
5. The power supplies and micro-switches controlling the egress electric locks at each of the turnstiles and the RE-4 personnel door located at the employee entry shall be de-energized upon activation of a fire alarm emergency or manual operation of the emergency evacuation pushbutton. Turnstiles shall immediately operate in the "free spin" mode (egress direction only). Inbound entry direction shall remain secure. Coordinate all requirements with Section 111415 – Turnstiles.

1.3 REFERENCES

- A. NEC: All electrical wiring work shall comply with the latest edition of the NEC.
- B. NEMA: Electrical equipment shall comply with applicable portions of NEMA.
- C. FCC: All assemblies shall be in compliance with FCC emission standards.
  1. Proximity/Contactless Smartcard Card Reading Sensors: Part 15, Subpart F (field disturbance sensors).



2. Dial-up modems: Part 68.
- D. UL-1012 and CSA: All power supplies shall be in compliance with Underwriters Laboratories standard 1012 and CSA standards for power supplies.
  1. UL-294: The system shall comply with Underwriters Laboratories standard 294 for Enterprise Physical Access Control Systems.

#### 1.4 SUBMITTALS

- A. Product Data: Submit for prior approval, Manufacturer's data on Enterprise Physical Access Control System and components, including manufacturer's model numbers, catalog data sheets, power requirements, dimensions, layouts, installation details, single line riser diagram.
- B. Shop Drawings: Submit dimensioned drawings of Enterprise Physical Access Control System and accessories including controllers, proximity card reading sensors, keypads, power supplies, switches, and ancillary equipment. Submit separate layout drawings of each terminal cabinet, equipment rack, control panel, interpanel and intrapanel wiring, power supplies, terminal strips, including labeling of all components, point-to-point wiring, and calculations for UPS power. Provide 1/8-inch scale floor plans showing locations of all devices.
  1. Submit dimensioned and scaled elevation drawings for each ePACS terminal cabinet showing the location of the reader interface modules, associated reader power supplies, terminal strips, surge protectors, receptacles and other ePACS components. Elevation drawings shall be submitted and approved prior to ordering the terminal cabinets.
- C. Security Riser Diagram: Shall detail the number and location of controllers, reader interface modules, power supplies, indicate all cabling and wiring, host equipment. Riser diagrams shall be submitted to the USPS Project Manager for review and concurrence prior to execution.
- D. Operator's Manual: Submit for prior approval, Manufacturer's manual for programming and operating the system and its related components.
- E. Submit evidence of training from the manufacturer of the system proposed for installation. Evidence shall include written certificates of training or similar documentation on manufacturer's letterhead demonstrating the installer's qualifications.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer: Manufacturer of products defined in this section must have:
  1. Industry experience: Company must have at least 5 years' experience in manufacturing and servicing integrated access control and alarm monitoring systems.
- B. Contractor:
  1. Furnish all labor, services, including a Systems Integrator, and materials necessary to furnish and install a complete, functional enterprise physical access control system (ePACS). The System shall comply in all respects with the requirements of the specifications, manufacturer's recommendations, and Underwriters Laboratories Inc. (ULI) listings.
  2. Furnish certification that the entire system has been inspected and tested, is installed entirely in accordance with the applicable codes, standards, manufacturer's recommendations and ULI listings, and is in proper working order.
  3. The USPS requires professional workmanship from an experienced "systems" installer and will reject any faulty workmanship or installation methods not meeting their satisfaction.
- C. Systems Integrator:
  1. Company with a minimum of 5 years system design, engineering supervision, and installation experience in the alarm, building automation, or Access Control industry.
  2. The Integrator shall obtain a Sensitive Clearance from the USPS. This clearance will be

coordinated by the USPS Project Manager. Use the following email for assistance in obtaining this clearance: [pacs-support@usps.gov](mailto:pacs-support@usps.gov)

- a. An interim clearance will be issued to allow the Integrator to request an ACE login from the USPS Project Manager.
- b. It will take a minimum of two weeks to obtain an interim clearance.
3. Company that is trained and authorized to install manufacturer products. The ePACS wiring shall be installed by a Systems Integrator trained and authorized to install and wire the manufactured products.
4. Company that has been successfully installing systems of equal size and complexity for a minimum of 5 years. Submit a minimum of 3 references. System references shall include projects where software and hardware installed is similar to the software and hardware proposed for this project.
5. The Systems Integrator shall include all necessary labor, tools, equipment, and ancillary materials required to furnish and install a complete and operational access control and alarm monitoring system.
6. The extent of Enterprise Physical Access Control System work is defined to include, but not be limited to:
  - a. Installation of and testing of system including controllers, reader interface modules, proximity/contactless smartcard card readers, keypads, input modules and output modules, software and photo-ID badge issuing system equipment.
  - b. Wiring, power supplies, switches, and ancillary equipment.
  - c. Programming of system, including creation/translation of database with USPS input, and access levels.
  - d. Operator Training for using and programming the system for up to 6 operators and 2 shift supervisors, provide in 2 sessions of 8 hours each. Provide 2 additional 8-hour training sessions 3 months after acceptance. Provide 2 sessions of 4 hours each for separate training for photo-ID badge production operators.
  - e. Submitting procedures for installing system on USPS networks and performing cut-over and acceptance testing on the system. Coordinate procedures with USPS Information Technology to ensure no interference with USPS network or systems.
  - f. Provide two 8-hour maintenance training sessions.

D. System Checkout:

1. Burn-in: 1,000 hours at normal operating conditions or equivalency.
2. On-site testing: Manufacturer trained and authorized Systems Integrator shall functionally test each component in the system after installation to verify proper operation and confirm that the panel wiring and addressing conform to the wiring documentation.
3. Service facility: Systems Integrator shall have service facilities within 4 hours travel time of the installation. Any increase in this time shall be approved by the USPS Project Manager.

1.6 WARRANTY

A. System Components: 12 months from date of acceptance.

1. Systems Integrator shall provide 24-hour emergency service for all reported system operational failures during such 12-month warranty period. The system must be fully operational within 48 hours. Include all necessary maintenance for the entire integrated system for the 12-month warranty period. On-site service response shall be 4 hours of the initial request for service and shall be provided 24 hours a day, 7 days a week inclusive of all holidays.
2. Service requests shall be reported via phone call to a designated service toll free phone number provided by the Systems Integrator.

PART 2 - PRODUCTS

2.1 USPS-SUPPLIED PRODUCTS

- A. The following items are Not in Contract but are supplied by the local USPS facility for incorporation into the Work by the Contractor. Contact USPS via email at [pacs-support@usps.gov](mailto:pacs-support@usps.gov) for assistance.
  - 1. Proximity access cards/badges.
  - 2. ACE standard server/workstations and software.
  - 3. Photo-ID badge printer.
  - 4. Digital badge camera, backdrop, consumables, and peripherals.

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**NOTE TO SPECIFIER**

*Verify manufacturer information, Product numbers, and availability at time of Project Manual preparation for Project. Review and confirm system requirements with USPS Inspection Services. Modify following paragraphs accordingly. Vanderbilt Industries has been selected by the USPS as the sole source provider for the system controller. Revisions to or substitutions for the controller are not permitted. All other ePACS peripheral components can be provided by any of the manufacturers listed below.*

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2.2 MANUFACTURERS

- A. Enterprise Physical Access Control System Controller:
  - 1. Contract transfer to Vanderbilt Industries (sole source provider for controller).
    - a. Contact the following.
      - 1) Patrick Shadood, USPS Account Manager, 2 Cranberry Road, Parsippany NJ 07054, office 973-316-3910; mobile 908-432-8806; fax 973-334-4850; [PatrickShadood@vanderbiltindustries.com](mailto:PatrickShadood@vanderbiltindustries.com)
      - 2) The Contractor is required to inform the manufacturer that the controller is for a USPS project.
  - 2. Section 016000 - Product Requirements: Product options and substitutions. Substitutions: Not Permitted.
- B. All other Enterprise Physical Access Control System peripheral components:
  - 1. Subject to compliance with project requirements, manufacturer offering Products which may be incorporated in the Work, including the following:
    - a. Alarm Controls Corporation (800) 645-5538.
    - b. Allegion/Schlage (877) 671-7011.
    - c. Altronix Corporation (888) 258-7669.
    - d. Bosch Security Systems, Inc. (800) 289-0096.
    - e. Ditek Corporation (800) 753-2345.
    - f. GE Security (800) 428-2733.
    - g. George Risk Ind./GRI (800) 523-1227.
    - h. HES Innovations (800) 626-7590.
    - i. HID Corporation (800) 237-7769.
    - j. Hirsch Electronics Corporation/Identiv, Santa Ana, CA (888) 809-8880.
    - k. Honeywell Security (800)323-4576.
    - l. Lenel Systems International (866) 788-5095.
    - m. Potter Electric Signal Co. (866) 240-1870.
    - n. Safety Technology International (STI) (800) 888-4784.
    - o. Software House (800) 507-6268.
    - p. Vanderbilt Industries: contact G. Patrick Shadood; Office - (973) 316-3910; Mobile – (908) 432-8806.
    - q. XCEEDID Corporation (877) 671-7011.

2. Section 016000 - Product Requirements: Product options and substitutions. Substitutions: Permitted.

## 2.3 MATERIALS AND COMPONENTS

### A. Enterprise Physical Access Control System Controller:

1. The Enterprise Physical Access Control System shall include microprocessor-based controllers by Vanderbilt Industries #VRCNX-A.
2. The Contractor is required to inform the manufacturer that the controller is for a USPS project.
3. The controller shall be ordered in a NEMA 1, metal enclosure for wall mounting and include integrated battery backup. The controller shall be equipped with keyed door latch.

### B. Controllers: provide complete hardware to operate with the following features:

1. The controllers shall support a minimum of 16 card reading sensors and shall be capable of supporting additional input and output modules. Vanderbilt Industries #VRCNX-A.
2. Database: Database shall store all user operating data and handle event reporting for all possible attached devices, and shall contain memory capacity for the following:
  - a. Minimum of 10,000 card holder records.
3. Event activity: System shall designate activity as an alarm or non-alarm condition, dependent upon modules installed, and shall report activity for:
  - a. Supervised monitor points: 92 minimum.
  - b. Outputs: 46 minimum.
4. Relay outputs: System shall initiate relay output commands based on:
  - a. Card Access Activity.
  - b. Operator Keyboard Inputs.
  - c. Pre-programmed Time Periods.
  - d. Input activation.
5. System diagnostics:
  - a. Automatic system diagnostics and automatic alarming based on detected faults in the controllers, card readers, wiring, and expansion modules. At a minimum, diagnostics shall include faults, card reader errors, input change of state, expansion module faults, host communications, power monitoring and reader communications errors. If a problem is detected, it shall be reported to the host (when communications is restored).
  - b. Each time the controller is powered, the panel shall go through an automatic diagnostic cycle. If a problem is detected, it shall be reported to the host. Diagnostics cycle shall include indications for fault, reader error, card swipe, monitor point change of state, host communication, card reader communication, program watchdog and power.
6. Transaction buffer: 5,000 transactions, minimum.
7. Flash memory for real time program updates from the host and/or locally connected computer.
8. Communication: Primary communications shall support TCP/IP protocols for Ethernet using the USPS structured wiring system via an on-board Ethernet port. In addition, the controllers shall have an on-board RS-232 port for local connection and emergency dial-up communications.
9. Tamper Switch: enclosure shall include a SPDT tamper switch wired at the factory.
10. UL-294 rated.
11. Power:
  - a. The controllers shall operate on 12 - 24VDC, powered from an external, regulated power supply with battery backup. The controllers shall provide necessary power to all card readers and expansion modules.
    - 1) Basis of Design (Reader Power Supply): Vanderbilt #SMS-6ALS, 6 Amp @ 24VDC.
  - b. Memory Retention: The controllers shall maintain configuration and card holder information for up to 72 hours when operating power is disconnected from the controllers.

### C. Reader Interface Module (RIM):

1. Each card reader sensor shall be interfaced with a dedicated, single reader interface module connected to the controller via RS-485 protocol, Vanderbilt "VRINX". Interface module shall have the following features:

- a. The reader interface module shall support multiple reader technologies including, but not limited to:
    - 1) Smart Card
    - 2) Magnetic Stripe (swipe or insertion)
    - 3) Wiegand (swipe or insertion)
    - 4) Proximity
    - 5) Biometric
    - 6) Barcode
  - b. Input/Output configurations:
    - 1) Inputs: 4 supervised or non-supervised.
    - 2) Outputs: 2 form "C" SP/DT 1A relays.
  - c. RS-485 communication: Up to 4,000 feet.
  - d. Power:
    - 1) Voltage: 14 – 24 VDC predicted upon read head used.
    - 2) Current: 120 mA @ 24 VDC (without read heads).
  - e. Operating temperature: 32 degrees to 120 degrees F.
  - f. Operating relative humidity: 10 – 90 percent non-condensing.
  - g. The reader interface module shall be mounted within NEMA 1, metal enclosure with keyed door latch.
- D. Input/Output Expansion Board:
1. Input/Output expansion boards shall be utilized to provide additional input and output responses in excess of the available input/output configurations at the reader interface modules. Expansion boards shall also be utilized to supervise multiple door contacts, exit alarms, etc. in lieu of using reader interface modules.
  2. Input/Output expansion board shall be connected to the controller via RS-485 protocol, Vanderbilt #VIONX-8.
  3. The input/output expansion board shall support universal triggers which integrate any input with any or all output responses and shall have the following features:
    - a. 16Kb flush memory and 1Kb RAM
    - b. Two serial ports (RS232 or RS485)
    - c. 8 supervised or unsupervised contact inputs
    - d. Contacts can be defined as alarms, door status, egress, or other environmental conditions.
    - e. 8 Form "C" SP/DT mechanically latching 1 A relay outputs.
    - f. NEMA 1, metal enclosure with hinged door and keyed door latch
    - g. BAA compliant.
- E. Card Reading Sensor:
1. General:
    - a. Card Reader (CR) shall read proximity cards and send signal to Controller for processing. The CR shall be compatible with:
      - 1) 125 KHz proximity, such as HID Corp 1000, capable of direct image printing (PVC overlay for direct image printing is acceptable).
    - b. Reader shall be listed in the FIPS 201 Evaluation Program Approved Product list <http://fips201ep.cio.gov/apl.php>
    - c. CR shall comply with the Standards for Facility Accessibility by the Physically Handicapped (USPS Handbook RE-4).
    - d. CR shall have the means to be electrically isolated to prevent short circuits from disrupting other communications in the data line network.
  2. Capacities:
    - a. CR shall read digital proximity cards signals to a minimum distance of 2 inches and contactless smartcard to a minimum distance of 1.5 inches (5.08mm) and does not require contact with the sensor.
  3. Long Range Proximity Card Readers (LRCR) to be provided at:
    - a. High-speed rollup doors.
    - b. Automatic impact doors.
    - c. Inbound Truck Maneuvering Area Gates (a LRCR on top due to mirror on high vehicles and a LRCR mounted low for cars).

- d. Employee parking area gates.
- e. These LRCR's are exempt from the requirements of FIPS201.
- f. Note that long range card readers require individual power supplies and batteries that must be served with 120-volt power. The power supplies shall be mounted within NEMA 1, metal enclosure equipped with keyed door latch.
- 4. Specifications: Material shall be Polycarbonate UL94, and shall be UV resistant, sealed, water and weather resistant, and tamperproof.
- 5. Environmental:
  - a. Humidity: 0 percent to 100 percent condensing.
  - b. Temperature: -40 degrees to +158 degrees F.
- 6. Regulatory: Controller shall be designed to meet the following regulatory requirements:
  - a. UL294 Listing Standard for Safety.
  - b. FCC EMI and EMC Class A.
  - c. EN55022 EMI and EMC Class A.
- 7. Mounting:
  - a. CR shall have the capacity to be mounted and operated behind any non-metallic, non-conductive surface, including glass.
  - b. CR shall have the capability to be mounted on any metal door frame.
  - c. Long range proximity card readers (LRCR):
    - 1) At high-speed rollup and automatic impact doors mount per manufacturer's recommendations for industrial powered trucks and protect CR from vehicle impacts.
    - 2) At Vehicle Gates mount per Standard Details.
- 8. Power:
  - a. Source: Via the Wiegand interface cable to the controllers.
  - b. The sensor shall emit a low power (less than one microwatt) RF field in up to 6 inches from surface.
- 9. Wiring: Multiple conductors overall shielded cable (6/C-#18 AWG minimum). Size cable gauge to meet distance requirements from the controllers.
- 10. Feedback:
  - a. Single tri-color LED (green/amber/red) shall provide capability for diagnostic feedback.
  - b. Green LED indicates valid card and red LED indicates invalid card.
  - c. An audio tone shall indicate successful digital proximity/contactless smartcard card read and access granted.
- 11. Diagnostics: CR and data-line integrity shall be monitored continuously and shall alarm if failure is detected and indicate device and location of fault.
- 12. Self-protection:
  - a. Physical damage, including breaking open sensor housing, shall not allow access to any circuitry which would allow the system to be compromised.
  - b. Transmission of any frequency (or set of frequencies) into the sensor at any power level shall not compromise the system.

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**NOTE TO SPECIFIER**

*Note that coded keypads shall only be utilized upon approved exception by USPS.*

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**F. Keypad:**

- 1. General:
  - a. The Keypad shall operate in conjunction with CR for an increased level of user authentication.
  - b. Where required, the keypad shall be integral to the CR and provided as a single card reader/keypad combination unit.
  - c. The system shall have the means to utilize a numeric keypad for entry of a Personal Identification Number (PIN).
- 2. Capacities:
  - a. Keypad only reader shall provide a standard 10-digit numeric entry organized in the standard telephone pad layout.
  - b. The user shall be able to enter a 4-digit Personal Identification Number (PIN).

- G. Power Supplies with battery backup: Provide separate power supplies for controllers, associated electric locks and reader interface modules not powered by controllers.
1. General:
    - a. Uninterruptible Power Supply shall provide continuous power to the controller, card reader, expansion modules, annunciator devices, and electric locks and operate from a 120VAC/60Hz source.
    - b. Provide external rechargeable battery(s) to maintain all controller, card reader, expansion module, and electric lock operation for at least 4 hours in event of power failure.
    - c. Power supplies and batteries shall be mounted within NEMA 1, metal enclosure equipped with keyed door latch.
  2. Capacities: The Power supply shall provide:
    - a. 12 Volt DC output to the controller; or 24-volt DC output to the electric locks.
    - b. Ampere output current at 12 VDC, 24 VDC – 6 amps continuous.
    - c. Power failure output and battery charger output.
  3. Environmental:
    - a. Humidity: 85 percent at 86 degrees F.
    - b. Temperature: 32 degrees to +122 degrees F.
  4. Regulatory: UL 294 and CSA.
  5. Power: 120VAC/60Hz source.
  6. Wiring:
    - a. The power supply shall be connected to the controller via wiring of at least 16 AWG.
    - b. The power supply shall utilize phoenix type connectors to allow for ease of field wiring and unit replacement or as recommended by the manufacturer.
  7. Feedback: A single LED indicates power ON condition.
  8. Self-protection: The power supply shall provide the following signals to the Controller:
    - a. Power fail.
    - b. Battery recharge signal.
  9. The electric lock power supplies controlling the exit doors shall be equipped with a fire alarm interface for emergency lock release.

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**NOTE TO SPECIFIER**

*Card readers and gate controls located remote from the main building, where the cost to trench is significant or where the area to be trenched spans a canal, body of water, tunnel or contaminated brownfield shall be equipped for wireless transmission when justified and approved by deviation. Specifier shall include paragraph 2.3 H. below for those applications.*

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H. Wireless Gate Control System:

1. Provide gate control kits #GCK400 as manufactured by "Allegion" (Vanderbilt compatible) to include:
  - a. (1) Wireless reader interface module #WR1400.
  - b. (1) Panel interface module #PIM400-TDZ.
  - c. (1) Remote, directional high gain antenna #ANT400-REM-I/O+6dB.
  - d. (1) Antenna grounding kit #MGB-MCA5.
  - e. (2) Plug-in power supplies #593-PI-12DC.
2. Gate control kits shall operate as follows:
  - a. The wireless reader interface shall communicate wirelessly to the existing ePACS controller via the wall mounted, remote antenna, the panel interface module and reader interface modules to allow access thru the remote parking entry gate and northwest and northeast pedestrian gates.
3. The terminal cabinets, reader interface modules, receptacles, card readers, Altronix power supplies, door contacts, RX motion sensor and electric strike are not "Allegion" products and must be separately procured.

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**NOTE TO SPECIFIER**

*Long range vehicle and driver identification readers with RFID recognition shall be utilized at existing truck entries where a long-range card reader cannot be properly located for driver access. Note that long range vehicle and driver identification readers shall only be utilized upon USPS approval of formal deviation request. Specifier shall include the paragraph below for those applications.*

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**H.I. Long Range Vehicle and Driver Identification Reader:**

1. Provide long range vehicle and driver I.D. reader based on semi-active RFID technology with the following key features:
  - a. Simultaneous vehicle and driver identification.
  - b. Read range up to 33 feet.
  - c. Object speed up to 125 mph.
  - d. Tag authentication based on AES encryption.
  - e. Adjustable read range.
  - f. Bi-directional communication using two RFID channels.
  - g. Robust industrial design.
  - h. USB, Wiegand, Magstripe, Barcode Communication interface.
2. Provide Long Range Vehicle and Driver I.D. Reader complying with the following technical specifications:
  - a. Dimensions: 13 x 10.8 x 5.5 inches.
  - b. Weight: 8.82 lbs.
  - c. Protection class: IP66.
  - d. Material: Cover ABS, Housing Die-casting ADC12.
  - e. Operating temperature: -22 to +140°F.
  - f. Relative humidity: 10% ... 93% relative humidity, non-condensing.
  - g. Power supply: 24 VDC, 0.7A; Output 24Vdc, 0.1A.
  - h. Power consumption: <20 Watt (on DC).
  - i. Read range: Up to 33 feet, message acceptance ratio > 80%.
  - j. Object speed: Up to 124 mph at appropriate distance.
  - k. Operating frequency: 2.438 – 2.457 GHz, 433.62 & 434.22 MHz (RX-Category 3) Ton
  - l. Antenna polarization: Circular (LHC) (2450 MHz) integrated antenna; Horizontal (433 MHz); dedicated antenna.
  - m. Air interface:
    - 1) 2.45 GHz: Nedap proprietary encoding standard.
    - 2) 433 MHz: Encryption based upon diversified AES128; 300kbps/ GFSK 75 kHz.
    - 3) Duty cycle < 1%; LBT not applicable.
  - n. Communication interfaces:
    - 1) USB, Wiegand, Magstripe (clock & data), Barcode (Code39).
  - o. Connectors: PCB screw connectors.
  - p. Tamper switch: Magnetic switch, normally closed.
  - q. Standards: CE, FCC, IC, ACMA, R-NZ, China\_CMIIT, UL294.
  - r. Included accessories: 9984364 Wall Mounting Set.
  - s. Basis of Design: Nedap Transit Ultimate #9215689.
3. The Long-Range Vehicle and Driver Identification Reader shall be provided with the following accessories:
  - a. Weather protection hood – Nedap #9218-327.
  - b. Pole mounting kit – Nedap #5626595.
  - c. Security key pack – Nedap #9216537.

<5sec.

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**NOTE TO SPECIFIER**

*Booster tags are required for mounting within each USPS vehicle requiring entry through the truck gate. Specifier shall include the appropriate quantity required for the specific application in paragraph below.*

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4. Long Range Vehicle and Driver Identification Booster Tags shall be provided for communication with the long-range RFID reader and easy mounting to the vehicle's windshield. When an authorized photo identification access card is inserted into the booster, it is read, and then boosted to the vehicle and driver identification reader; access is granted, and the gate opens automatically.
  - a. Basis of Design: Nedap Smartcard Booster Ultimate #9948538B9982809.
  - b. Quantity required: [50] Boosters Tags.

~~H.J.~~ Electric Door Strike

1. The electric strike shall transmit data to the interface module indicating the bolt is not engaged and the strike mechanism is unlocked. Power line supervision shall incorporate an end-of-line resistor.
  - a. Electric strike shall be concealed for use with cylinder locksets.
  - b. Electric strike shall be tampered resistant and rated 12 or 24 VDC with internally mounted solenoid.
  - c. Electric strike shall accommodate 1/2 inch to 5/8-inch cylindrical latch bolt (5/8 inch with 1/8-inch door gap).
  - d. Field selectable "Fail Secure/Fail Safe" (set to "Fail Safe").
  - e. Basis of Design: Assa Abloy #HES8000C (complete with faceplate).

~~J.K.~~ Magnetic Lock

1. Provide bracket mounted, magnetic lock with 1200 pounds of holding force suitable for single door leaf installations. Double leaf doors shall be equipped with (2) single magnetic lock assemblies in separate enclosures. The magnetic lock shall have the following features:
  - a. U.L. 294, U.L. 10C and U.L. 864 Listed.
  - b. Current Draw: 505 mA. @12 VDC.  
Magnet Size: 10-1/2 L x 2-7/8 H x 1-1/2 W.
  - c. Armature Size: 7-1/4 L x 2-3/8 H x 5/8 W inches.
  - d. Clear anodized finish.
  - e. Lifetime Warranty.
  - f. Magnetic lock to include all necessary mounting plates and brackets.
  - g. Built-in ARC suppression.
  - h. Instant Release: No hysteresis.
  - i. Basis of Design: Alarm Controls #1200S.

~~K.L.~~ Door Contact Switch

1. Furnish and install door contacts at each door location indicated on the drawings. Door contact switches shall be concealed type, recessed in the jamb, opposite the hinged location.
  - a. Install per manufacturer's written recommendations and maintain the minimum gap separation.
  - b. Door contacts shall be compatible with steel doors and jambs.
  - c. Door contacts for new doors shall be concealed type only. Surface mounted door switches shall only be installed on existing doors and frames.
  - d. Basis of Design:
    - 1) ~~UTC-GE/Sentrol #3005-N with 1k ohm resistor (recessed roller plunger). Interlogix-Magnetic Contacts, #1085TWN with 1K ohm resistor (surface mount).~~
    - 2) ~~UTC-GE/Sentrol #1078CW with 1k ohm resistor (recessed steel door) Interlogix-Roller Plunger, #3005-N with 1K ohm resistor (recessed - wood doors).~~
    - 3) ~~GRI #4460A with 1k ohm resistor (surface mount) Interlogix Roller Plunger, #1076CW-N with 1K ohm resistor (recessed-steel doors).~~
    - 4) ~~Seco-Larm #SM-226RQ with 1k ohm resistor (overhead door) Interlogix Overhead-Door Magnet Contacts, #2315A-L with 1K ohm resistor (track mounted, overhead-door contact - closed loop).~~

~~L.M.~~ Emergency Evacuation Pushbutton

1. Manual activation of the emergency evacuation pushbutton shall de-energize the power supplies and micro-switches serving the egress electric locks at the turnstiles and RE-4 personnel door.

The turnstiles shall immediately operate in the "free spin" mode (egress direction only). Inbound entry direction shall remain secure. Normal exit operation of the turnstiles and RE-4 access gate will be disabled until the manual reset of the pushbutton. Minimum reset time shall be set at 30 seconds, per NFPA 101.

2. The pushbutton shall have indoor, "blue" polycarbonate housing with protective cover and the following features:
  - a. Push to activate; turn to reset operation.
  - b. "Red" LED indicator light.
  - c. Raised label to read "Emergency Evacuation Pushbutton".
  - d. 2 form "C" maintained contacts, rated 10 Amps at 125/250 VAC.
  - e. UL/cUL Listed, ADA compliant.
  - f. Indoor flush or surface mount.
  - g. Basis of Design: Safety Technology International, Stopper Station Series SS2429ZA-EN. Substitutions: Permitted.

**M.N.** Exit Door Alarm

1. All controlled exit doors requiring emergency egress shall be equipped with an audible and visual alarm station. The horn/strobe exit alarm shall be equipped with a remote key operated "reset" station and shall be 12 VDC powered from the lock power supply and batteries located at the controller.
2. The exit door alarm shall have white polycarbonate housing and blue lens with the following features:
  - a. U.L. Listed; CE approved.
  - b. Sound output: 101 dBA at 10 ft. (minimum)
  - c. Single tone: Piezo Siren-Warble.
  - d. Current draw: 748 mA at 12 VDC.
  - e. Rating: 12 VDC regulated.
  - f. Indoor flush or surface mount.
  - g. Flash rate: Same as siren sounding.
  - h. Basis of Design: AMSECO #SSX-52SB. Substitutions: Permitted.
  - i. Alternate Manufactures: ~~ADI/WBox #OE-SRNSTROBT.~~
    - 1) ADI/WBox #OE-SRNSTROBT.
    - 2) ATW/Bosch – "The Doberman"
  - j. Substitutions: Permitted.
3. Key operated "reset" stations for all door alarms shall be keyed alike and shall be wall mounted top at 60 inches AFF, adjacent to the door.
  - a. Basis of Design: Alarm Controls #KA105A.
4. Due to the capacity of the lock power supply, alarm and visual indications shall operate continuously for no more than 45 seconds. The visual/audible alarm shall be field adjusted to operate 30 seconds, if not reset.

**N.O.** Door Release Pushbutton

1. Doors equipped with electromagnetic locks requiring free egress shall be released by a pneumatic time delay pushbutton.
2. Pushbutton shall contain 1-1/2-inch diameter, mushroom head and pneumatic time delay with the following features:
  - a. U.L. listed components.
  - b. Green mushroom pushbutton with single gang, stainless steel plate.
  - c. Contacts rated 10A at 35 VDC.
  - d. Time range settable 2 seconds to 60 seconds.
  - e. One Normally open and one normally closed contact.
  - f. Switch time repeatable  $\pm 10$  percent.
  - g. Labeled "Push to Exit".
  - h. Basis of Design: Alarm Controls #TS-14.

## PART 3 - EXECUTION

### 3.1 INSTALLATION METHODS

- A. Drawings are schematic and diagrammatic. Use judgment and care to install Work to function properly and fit within building construction and finishes. Power and low voltage conductors, conduit, components, not shown or specified, which are required to produce a complete and operative system are required to be furnished and installed. Refer to Section 260500 - Common Work Results for Electrical.
- B. Exact location of components is determined from dimensions on the Drawings, manufacturer's shop drawings, or as may be determined at Project Site. Do not scale Drawings for exact location of any item. Verify item mounting heights as required by project conditions, prior to rough-in.
- C. Route conduits and wiring associated with equipment and systems above ceilings, in chases, and concealed within building structure.
- D. All interior conduits shall be EMT with steel set-screw type couplings. All exposed exterior conduits (and interior conduits mounted below 10 feet – 0 inches AFF within the workroom) shall be heavy wall, rigid galvanized steel type.
- E. All concealed and exposed conduit and cabling shall be routed parallel and perpendicular to structural elements.
- F. All cables and conduits shall be routed below the roof decking to avoid damage due to future reroofing. Raceways and cables shall not be routed between the decking flutes.
- G. Surface mounted raceways or conduit permitted only at locations indicated on Drawings.
- H. Proposed equipment or devices, shown mounted on and/or adjacent to equipment, which if installed, would impair proper operation of existing or new equipment, shall be removed and relocated by Contractor as required so equipment will function properly. Notify USPS Project Manager immediately if any such condition exists.
- I. Seal and make permanently watertight penetrations by raceways or equipment through ceilings, walls or floors.
  - 1. Seal penetrations in non-fire rated ceilings, walls or floors material specified in Section 079200 – Joint Sealants.
  - 2. Seal penetrations in fire rated walls with material specified in Section 078400 - Firestopping.
- J. Install equipment and materials to provide required working clearance for servicing, repair and maintenance. Coordinate final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow required space for removal of parts that require replacement or servicing.
- K. Install materials and equipment level and plumb, parallel, and perpendicular to other building systems and components.
- L. Coordinate all cutting, patching and site work with the **[Design Build Entity]** **[or]** **[General Contractor]**.
- M. Touch-up scratched and marred surfaces to match original finishes; remove all dirt and construction debris.
- N. All work areas shall be left in a broom swept condition at the end of each day.

### 3.2 INSTALLATION - HANGERS AND SUPPORTS

- A. Install products in accordance with manufacturer's published instructions. Install all electrical equipment in accordance with Section 260500 - Common Work Results for Electrical.
- B. Furnish and install anchors, fasteners, and supports in accordance with NECA SI.
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use spring steel clips and clamps.
- E. Do not use powder-actuated anchors.
- F. Obtain permission from structural engineer before drilling or cutting structural members.
- G. Fabricate supports from structural steel angle or structural steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- H. Install surface-mounted cabinets with minimum of four anchors.
- I. In wet and damp locations use structural steel channel supports to stand cabinets one inch off wall.
- J. Use sheet metal channel to bridge studs above and below cabinets recessed in hollow partitions.

### 3.3 INSTALLATION – TERMINAL CABINETS

- A. Terminal cabinets shall be provided to house long range reader power supplies, interface modules, SPDs and other access control system components. Enclosures shall be hinged and lockable with panelboard construction and plywood backboards.
- B. ePACS terminal cabinets shall not contain CCTV components. The ePACS shall utilize independent wiring, raceways, and cabinets.
- C. Terminal cabinets shall be wall or pedestal mounted with bottom of cabinet at no less than 12 inches. A.F.F. or A.F.G. Provide NEMA Type 1 enclosures within interior locations and NEMA Type 4 stainless steel or non-metallic polycarbonate type for exterior locations. Pedestal mounted cabinets shall be supported utilizing 4-inch square concrete posts buried 24 inches below finished grade and set in concrete footing with 6 inches of concrete all around.
- D. Terminal cabinets shall be amply sized to accommodate all components without overheating and forced air exhaust fans shall be provided. Cabinets shall be equipped with copper ground busses and those requiring 120 Volt power shall be provided with appropriate number of 20 Amp, 125 Volt receptacles complete with surge protection. Receptacles shall be securely mounted within the cabinet.
  - 1. Components shall be individually mounted and secured to the backboard. Stacking of components is not acceptable and the use of tie-wraps is prohibited.
  - 2. Long range, card reader power supplies shall be fed from 120 Volt circuits segregated to serve only the power supplies. Circuits utilized to feed gate controllers, CCTV components or any other non-related loads shall not be utilized to serve the ePACS or intercom equipment.
  - 3. Multi-output, fused power supplies may be utilized within the terminal cabinets to serve multiple long range car readers, provided each output is fuse protected.
- E. Exterior terminal cabinets mounted near or adjacent to vehicular traffic shall be protected using 6-inch dia. x 4 feet high concrete bollards. Exterior terminal cabinets shall be located within the secured area of the facility.

- F. Exterior terminal cabinets shall be equipped with a copper ground bus bonded to a driven ground rod using #2/AWG copper grounding electrode conductor.

### 3.4 EQUIPMENT INSTALLATION AND DOCUMENTATION

#### A. Installation:

1. The Enterprise Physical Access Control System shall be installed and wired completely on the USPS structured wiring system as shown on the plans by factory trained and authorized employees of the Systems Integrator.
2. Systems Integrator shall make all necessary wiring connections to external devices and equipment. Systems integrator shall program anti-pass back modes into the system in accordance with USPS requirements. Use the following e-mail for assistance in obtaining information regarding current USPS requirements: [pacs-support@usps.gov](mailto:pacs-support@usps.gov).
3. Systems Integrator employees shall carry proof of manufacturer's certification at all times.
4. Install systems to conform with the approved submittal data. Where coordination requirements conflict with the system requirements, refer conflicts to the USPS Project Manager.
5. All Enterprise Physical Access Control System devices shall be securely mounted to the building structure and fastened with tamper resistant screws. Provide USPS with three sets of tamper screw removal tools to be stored locally for service and maintenance.
6. All wiring connections shall enter enclosures at one location and be neatly dressed.
7. Device Mounting:
  - a. The controllers shall be wall mounted in a secure area.
  - b. The power supplies shall be installed in a secure area adjacent to the controllers.
8. All DC operated locking hardware, relays, and all other inductive loads shall have a diode connected to them to prevent noise and/or any induced currents. All AC operated relays or electric strikes shall have a MOV connected to them to suppress any current induced noise. Diodes and MOVs shall be connected at the strike or relay and shall be of the type recommended by the device manufacturer.
9. Install PIR request-to-exit sensors such that "corridor pedestrian traffic" will not activate the sensor. Ceiling or wall mount shall be acceptable. Adjust the pattern and sensitivity such that detection is ensured for all egress attempts and such that detection cannot be achieved from the exterior side of the door.
10. The in/out card readers controlling the same door shall be wired to the same controller; Universal Triggering Software shall not be utilized.
11. Each reader interface module shall be individually homerun to their respective controller; daisy-chaining is not acceptable.

#### B. Network Communications:

1. Installer shall coordinate all network communications wiring requirements with the structured cabling system provider to insure transmission pathway through the structured wiring system.
2. Telecommunications outlets and cabling for equipment as shown on the plans are specified under Section 270500 - Common Work Results for Communications.
3. Refer to "ePACS Standard System Configuration" and "Access Control (ePACS) SOP" for database configuration and local facility responsibilities.

#### C. Documentation:

1. Accurate "as built" drawings shall be furnished before final acceptance is requested, by the Systems Integrator to aid the USPS in programming. These shall indicate the door(s) controlled by each lock output, the monitoring points for the door-controlled area, host server, workstation and badge issuing station location, all controllers locations, all electrical circuit and telecommunications outlet designations and any annunciator outputs or special inputs into the system in hard copy and electronic format (AutoCAD-coordinate version requirements with the USPS Project Manager).
2. The Systems Integrator shall supply 6 copies of operating and maintenance manuals to aid the USPS in the programming of the system.

D. Special Requirements for Cable Routing and Installation:

1. The majority of the ePACS wiring in this building will be installed above ceilings without conduit. All communications cabling used throughout this project shall comply with the requirements as outlined in the National Electric Code (NEC) article 725. All cabling shall bare CMP and/or appropriate markings for the environment in which they are installed.
2. Seal openings, existing or created, for cable pass through between floors, through rated fire and smoke walls. Creation of such openings as are necessary for cable passage between locations as shown on the drawings shall be the responsibility of the Contractor's work. Any openings created and left unused shall also be sealed as part of this work.
3. Cabling routed underground, on the exterior, through inaccessible ceilings or less than 10 feet A.F.F. in the workroom shall be contained in conduit. Provide flush boxes within finished areas and factory boxes in unfinished areas. Provide 3/4-inch conduit risers with 90-degree bend and bushing for all wall mounted devices.
4. The entire ePACS system shall utilize an independent wiring system not shared with any other building system. The structured cabling system racks, the TE's, the fiber backbone, cable trays, etc. cannot be utilized for any ePACS purpose. Cable trays installed for the ePACS cabling may be utilized to contain the CCTV wiring.

E. Surge Suppression:

1. Provide individual surge protective devices (power and low voltage) at both ends of all exterior copper ePACS wiring and associated wiring exiting the building. Surge suppression shall be provided for the power and control wiring associated with the barrier arm and sliding gates, exterior card readers, exterior reader interface modules, power supplies, door contacts and magnetic locks. Refer to Section 264128 - Surge Protective Devices (SPD).
2. Provide high-definition photographs showing the installation of the required surge protection devices at both ends of all exterior power and low voltage conductors. Photographs shall be transmitted to the A/E and USPS Project Manager.

F. Gate and Door Release:

1. The gate and door release functions required for vehicle and employee entry shall not be controlled or wired as part of the ePACS. Independent wiring from the video intercom CEU is to be provided. The video intercom system shall perform all the gate and door release functions. Loss or interruption of the ePACS shall not affect the operation of the gate or door release functions.

### 3.5 SERVICE AND SUPPORT

A. Startup:

1. The Systems Integrator shall coordinate all system database requirements with the USPS and build the system database for the host server and workstations. At a minimum the Systems Integrator shall:
  - a. Provide worksheets to the USPS with requested database information a minimum of 4 weeks prior to anticipated system startup.
  - b. Load all system device names and system addresses.
  - c. Load basic access levels.
  - d. Load and test all applications and interfaces.
  - e. Load and test sample proximity cards compatible with USPS Standard Card.
2. After the system has been installed, the documentation delivered to the USPS and network communications is established in compliance with Sections 3.1 & 3.2, A above, the Systems Integrator shall verify correct operation of all system components and demonstrate and test the system for the USPS.
3. Final system acceptance testing shall be conducted by the USPS Project Manager or, at the option of USPS, their authorized representative. Acceptance testing shall demonstrate all aspects of the Enterprise Physical Access Control System as described in the contract documents. The Systems Integrator shall make provisions for testing (any simulations required for testing) and provide a final acceptance test plan a minimum of one week prior to the anticipated testing date.

4. Final acceptance testing shall be conducted on the completed system as described in this specification and configured to the satisfaction of the USPS Project Manager.
5. The Systems Integrator shall guarantee all material and workmanship involving the system for 12 months after startup.

B. Training:

1. After system startup, the Systems Integrator shall instruct USPS personnel in how to program the system and demonstrate a typical operating program for each type of access-controlled area.
2. Enterprise Physical Access Control System training sessions shall be arranged with the USPS at least one week prior to the training date. Training manuals shall be delivered for each trainee with one additional copy delivered for archiving on the project site.
3. Training manuals shall consist of an agenda, defined objectives for each lesson, a detailed description of the subject matter of each lesson, and the manufacturer's written operation and system manuals. At a minimum, training agenda shall consist of the following.
  - a. An overview of the system components and features.
  - b. A detailed description of how the equipment will operate to meet the performance requirements of the Enterprise Physical Access Control System.
  - c. A description of the operating system and application software.
  - d. Start up and orderly shutdown procedures for the system.
  - e. Hands on training on all Enterprise Physical Access Control System software and hardware features.
  - f. Basic troubleshooting guide intended to identify the source of system problems.
  - g. System configuration and data back-up and restoration procedures.

C. Warranty Support:

1. The Authorized Systems Integrator shall be available during the warranty period to answer programming and application questions to support USPS personnel during this period.
2. The Authorized Systems Integrator shall have the training and capability to provide additional support services including:
  - a. Regular testing and inspection of all system components and to submit reports on the results.
  - b. Emergency Service for repairs and adjustments to the system and part replacement if necessary.

END OF SECTION

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