SECTION 282306

DIGITAL-HYBRID, STAND-ALONE, IP BASED CCTV SYSTEM

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**NOTE TO SPECIFIER**

***\*\*This specification section can only be used with a written approved deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.***

*Use this specification section to specify a digital-hybrid, stand-alone (non-ISIP) CCTV System for Mail Processing Facility projects only when replacing an existing non-functioning legacy system that is not currently remotely monitored.*

***This is a Type 4 Specification with*** ***Direct Vendor text; these Sections contain a Direct Vendor, which is a product supplier with a pass-through pricing (PTP) agreement with USPS. The General Contractor must order the specified products and/or services from the Direct Vendor, therefore only portions of the text indicated*** ***with a “Note to Specifier” can be modified. 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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1. GENERAL
	1. SUMMARY
		1. Section Includes:
			1. Provide and install a complete IP Video System including, but not limited to:
				1. IP Video Surveillance Cameras, housings, mounts, power supplies, cabling, and related equipment.
				2. Video management software.
				3. Video monitoring and recording equipment.
				4. Equipment enclosures and remote node cabinets.
				5. Local Network equipment including routers and switches.
		2. Direct Vendor:
			1. In the Offer, include the cost of all equipment including the cameras, housings, mounts, servers, monitors, network switch, etc. that are to be procured directly from the Direct Vendor (Securitas Electronic Security) utilizing the pass-through pricing (PTP) process. “PTP” allows you to directly order parts and equipment at prices leveraged by the Postal Service. Purchase parts and equipment in the name of your Company, which will be responsible for inspection, acceptance and payment to the “PTP” supplier.
			2. The cameras, monitors and associated equipment shall be supplied and installed by Securitas Electronic Security, Inc the sole approved USPS CCTV Direct Vendor. The video servers shall be furnished by the USPS and installed and programmed by the Direct Vendor under the supervision of the General Contractor. The Direct Vendor is to provide a Bill of Materials, pricing, and installation costs. The General Contractor is responsible for power, conduit, cable tray, cable and cable pulling. For assistance contact the Direct Vendor at:

Securitas Electronic Security, Inc.
Michael Tracey, USPS Account Manager
3 Westchester Plaza
Elmsford, NY 10523
Cell: 571-451-7629
e-mail: michael.tracey@Securitases.com

* + - 1. Contract to Securitas should be addressed to:

Securitas Electronic Security, Inc.

1790 Graybill Road, Suite 100

Uniontown, OH 44685

* + - 1. Securitas Electronic Security, Inc. Inquiry Number: 855-331-0359
		1. General Contractor:
			1. Responsible for providing power, conduit, cable tray, cable, and cable pulling and NEMA 1/ NEMA 4 enclosures to be used as part of the installation.
			2. Provide AutoCAD electronic copies of the final camera placement drawings and camera schedules (from the project issued for construction drawings produced and provided by the design A/E) to the Direct Vendor and any requested documentation. This will include head end and remote node locations and any monitors requested.
		2. 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 Direct Vendor) shall be left on-site during the final acceptance. Manuals will not be provided prior to installation completion.
		3. Prompt Payments. In accordance with the Contractor Certification on Postal Service Form 4211B, “Project Contract Payment Authorization”, the contractor certifies that prompt payment, (within 30 days) to the subcontractor (Direct Vendor) will be made.
		4. Related Sections:
			1. Section 260500 – Common Work Results for Electrical.
			2. Section 260533 – Raceway and Boxes for Electrical Systems.
	1. REFERENCES
		1. 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.
	2. SYSTEM DESCRIPTION
		1. Design Requirements: IP video system between points of surveillance indicated on Drawings and the headend consisting of video IP cameras, camera outlets, camera controls, monitors, control stations, distribution components, video servers and accessories.
	3. DEFINITIONS
		1. 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.
		2. “Blue Sky”: Exterior cameras mounted remote from the building exterior wall are to be considered “blue sky” applications.
	4. SUBMITTALS
		1. Section 013300 - Submittal Procedures:
			1. Product Data: Manufacturer’s specification sheets for each component shall not be required for all products provided as part of this Direct Vendor agreement.
			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 to be provided to the General Contractor.
			3. Final As-Built Drawings, Operation and Installations Manual, will be supplied directly to USPS and stored within the rack per USPS Project Manager.
		2. Shop Drawings:
			1. The Direct Vendor will provide a Standard Drawing Package that shall be utilized for the installation of the CCTV system. This package shall include:
				1. Block Diagram: System block diagrams noting major system components and interrelationships of each component.
				2. Equipment Racks: Rack elevation drawings showing equipment arrangement.
				3. The shop drawings shall include camera placement (camera placements shall be provided by the project specific design entity).
			2. The General Contractor shall submit dimensioned and scaled elevation drawings for each CCTV terminal cabinet and equipment enclosure 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.
		3. Field Testing Reports for Cat-6 Copper and Fiber Optic Cable
			1. Test reports: Typewritten with complete listing of all required test parameters.
			2. Submit test reports prior to installation of any cameras or the headend.
		4. Sequence and Scheduling Plan: Direct Vendor shall provide installation scheduling plan for review and approval. Coordinate scheduling of software and revisions with the USPS.
		5. Section 017704 - Closeout Procedures and Training:
			1. Operation and Maintenance Data: Include data for each type of product, including features and operating sequences, both automatic and manual. This information shall be supplied directly to the USPS by the Direct Vendor.
			2. Product Quick Reference cards for the operation of all key system components.
			3. Project Record Documents: Direct vender shall provide field-accurate drawings that reflect actual locations of cameras and, indicating cable identifiers, layout, location and numbering of system devices to reflect as-built conditions. The General Contractor shall provide routing of cabling in-formation.
			4. Provide a final materials list of equipment installed and spare parts on hand. Materials list shall include model number, serial number, and date installed.
			5. Provide a copy of all software including the operating system, product keys and copies of all product licensing. This information shall be supplied directly to the USPS by the Direct Vendor.
			6. Project Completion Certification: Document signed by the direct vender and a Postal Service representative indicating that the project is fully complete with all punch-listed items resolved. In new construction, the General Contractor will sign the project completion certification.
			7. Operating Instruction:
				1. Provide on-site instruction 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.
				2. Provide one complete set of equipment operating and installation manuals that will be stored in the rack per USPS Project Manager.
	5. QUALITY ASSURANCE
		1. 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 manufacturer products and approved by the CCTV Direct Vendor. The CCTV wiring shall be installed by a CCTV systems installer trained and authorized to install and wire the manufactured 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. The Contractor shall 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. The Contractor shall 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.
	6. DELIVERY, STORAGE AND HANDLING
		1. Section 016000 - Product Requirements: Transport, handle, store, and protect products.
		2. Keep devices and equipment in manufacturer's packaging in a secured location until system is ready for installation.
		3. Comply with Direct Vendor requirements. Coordinate storage location with the Postal Service.
		4. The equipment delivered must be insured at the contractor’s expense through acceptance.
	7. DIRECT VENDOR WARRANTY/SERVICE/TECHNICAL SUPPORT PLAN
		1. Warranty:
			1. Direct Vendor to include manufacturer warranty for one year after facility acceptance and project completion certification for materials and labor.
				1. 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 Direct Vendor warranty period.
				2. USPS shall not be required to process any paperwork in order to be entitled to service plan coverage. It is the Direct Vendor’s sole responsibility to monitor and comply with warranty eligibility.
				3. Where operational performance is substantially affected, all software and firmware shall be upgraded to the latest version supported by the purchased hardware platform throughout the service plan period and be provided at no cost to USPS. Such upgrades shall be covered under the warranty/service plan and are at the discretion of the USPS Project Manager.
				4. Any software bugs 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.
				5. Any software bugs 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.
				6. Turnaround time for all repairs (warranty and out-of-warranty) shall not exceed 72 hours.
				7. The annual “PM” service performed by the Direct Vendor shall include testing and exercising of the PTZ cameras. Direct Vendor shall provide annual service test results to USPIS/OIG.
		2. Technical Support:
			1. Direct Vendor shall provide toll-free 24/7 technical support at no charge throughout the warranty period.
			2. Direct Vendor shall provide on-site installation support. These visits shall include pre-construction site survey and project review, punch-list generation, and final inspection and system certification.
			3. Data Recovery — Direct Vendor shall 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.
				1. Turnaround time for data recovery shall be less than seven days from receipt of hard drives at Direct Vendor’s data recovery center.

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**NOTE TO SPECIFIER**

CCTV systems consisting of 50 cameras or less must require one of each of the indoor/outdoor fixed and PTZ cameras as extra stock items. CCTV systems in excess of 50 cameras must require 2 of each of the indoor/outdoor fixed and PTZ cameras as extra stock items. Include only the camera types and components utilized for the specific project. Edit sentences 1.9A.1. & 1.9A.2. below, accordingly.

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* 1. MAINTENANCE STOCK SUBMITTALS:
		1. At the completion of the installation, furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. These extra materials shall be stored within the Investigative Office.
			1. Indoor/Outdoor fixed camera: [One] [Two] camera[s].
			2. Indoor/Outdoor PTZ camera: [One[ ]Two] camera[s].
			3. Indoor/Outdoor, multi-sensor camera: One camera complete with housing.
			4. Video decoder: One decoder.
			5. Fiber optic transmitter/receiver: Two of each type.
			6. Camera power supply transformer: One power supply.
			7. Ethernet cable injectors: Two injector modules.
		2. These extra materials are to be used as advanced replacement parts in cases where USPS operational issues require immediate replacement and procurement of the material is delayed due to unavailability from the manufacturer. The spare parts utilized are to be replenished upon completion of the replacement or repair. Installation of the replacement units shall only be performed by an authorized representative of the Direct Vendor.
1. PRODUCTS
	1. MANUFACTURER
		1. Selected Direct Vendor:

Securitas Electronic Security, Inc.

Michael Tracey, USPS Account Manager

3 Westchester Plaza

Elmsford, NY 10523

Cell: 571-451-7629

e-mail: michael.tracey@Securitases.com

* + 1. Section 016000 - Product Requirements:
			1. Product options and substitutions are not permitted without a written and USPS approved deviation.
			2. All equipment to be supplied under this specification shall be new and the current model of the Direct Vendor listed above.
			3. Systems and components shall have been thoroughly tested and proven in actual use.
	1. VIDEO SERVER AND STORAGE
		1. Based on the Construction Documents, the General Contractor shall purchase all equipment from the Direct Vendor.
		2. Server:
			1. Server/Storage Requirements: Server 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 server(s) fit for the site. These servers are all video servers that contain USPS IT ACE images. These are approved CLINS and Assets by USPS.
				1. Storage for 30 Days continuous video with 30% expansion capability and motion identified assuming a frame rate of no less than 15 fps. Depending on size of system storage may be either internal to the server or external iSCSI attached NAS device.
				2. UPS Power Supplies for Server and Storage.
				3. Input Power: 120VAC, 60Hz (a power adaptor may be used to provide this voltage).
				4. Operating Temperature: Range shall be equal to or greater than 10 to 40 degrees Celsius.
				5. Humidity: Withstand a minimum of 10% to 80% humidity.
				6. Software: “March Networks” Video Management System – purchase one license per camera.
				7. NVR (Network Video Recorder): “March Networks”.
				8. Laptop computer.
				9. All items rack mounted.
			2. The video servers shall be furnished by the USPS and installed and programmed by the Direct Vendor under the supervision of the General Contractor.
	2. IP VIDEO SWITCH
		1. CISCO Network Switch (IP Video):
			1. Based on the Construction Documents, the CISCO Switch is to be procured by the General Contractor from the Direct Vendor.
	3. VIDEO DECODERS
		1. Video Decoders will support up to (2) remote monitors with full screen camera views; (4) camera views per monitor.
		2. Camera displays approved only by OIG and IS.
			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.
		3. 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.
		4. Basis of Design: Costar #CV12MV2.
	4. VIDEO CAMERAS
		1. Direct Vendor shall provide cameras and required licensing.
		2. IP Color cameras for video surveillance and monitoring of specific areas as shown on the drawings and confirmed with Postal Inspection Service and USPS Project Manager.
		3. Fixed, indoor/outdoor, 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 polycarbonate transparent cover where required.
			3. Equipped with pixel counter.
			4. Image sensor: Progressive scan RGB CMOS 1/2.8 inch (effective).
			5. Lens: Varifocal, 3.0 to 9mm, F1.3, P-IRIS, remote focus and zoom: 91 degree to 30 degree horizontal.
			6. Minimum illumination:
				1. Color: 0.04 LUX, F1.3.
				2. B/W: 0.008 LUX, F1.3.
			7. Shutter time: 1/8,000 to 1/6 second; 60 Hz.
			8. Pan/Tilt/Zoom: Digital PTZ, preset positions, guard tour.
			9. Angle Adjustment: Pan 360 degrees, tilt 9 to 95 degrees, rotation +180 degrees.
			10. Resolution: 1920x1080 (2 MP).
			11. Support simultaneous Motion JPEG, MPEG-4 and H264.
			12. Frame Rate:
				1. H.264; 30 fps in all resolutions; 60 Hz.
				2. Motion JPEG; 30 fps in all resolutions; 60 Hz.
			13. Support both unicast and multicast MPEG-4.
			14. Support Power over Ethernet according to IEEE802.3af.
			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: Indoor/Outdoor; IP66, NEMA 4X and IK10 impact resistant, aluminum dome with encapsulated electronics. Smoke transparent cover.
			21. Processor and Memory: 512 MB RAM, 256 MB Flash.
			22. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
			23. Operating Conditions: Indoor/Outdoor; -40 to 140 degrees F; 0 to 95 percent RH.
			24. Accessories: Mounting plate, polycarbonate transparent cover. Provide ceiling, pendant or wall bracket mounting and connector kits.
			25. Basis of Design: Indoor/Outdoor, Avigilon #2.0C-H5A-DXX-2MP.
		4. Indoor/Outdoor PTZ camera shall be a network dome camera and shall incorporate 30x 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 polycarbonate 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 30x optical zoom.
			5. Image Sensor: Progressive scan CMOS 1/2.8”.
			6. Lens: F1.6 to F4.7, 4.3 to129mm autofocus. Angle of view: Horizontal 2.3 to 63.7 degrees, vertical -0 to 90 degrees.
			7. Minimum Illumination: 0.1 LUX @ F1.6 (color mode).
			8. Shutter Time: 1/10,000s to 1s.
			9. PTZ:
				1. E-Flip, 100 preset positions.
				2. 45x optical zoom and 100x digital zoom.
				3. Pan: 360 degrees endless.
				4. Tilt: 180 degrees, -10 to 90 degrees.
			10. Video Compression: H264 (MPEG – 4 part 10/AVC) baseline, main and high profiles motion J-PEG.
			11. Resolution: 1920 x 1080 (2 MP).
			12. Frame Rate: Up to 60 fps in all resolutions.
			13. Support multiple, motion JPEG4 and H264.
			14. Support Power over Ethernet according to IEEE802.3af.
			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 full memory card for alarm triggers.
			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: Indoor/Outdoor; IP66, IK10 and NEMA 4X impact – resistant aluminum. Smoke transparent cover.
			21. Processor and Memory: 512 MB RAM, 256 MB Flash.
			22. Connectors: RJ45 10 BASE – T/100BASE-TX PoE push-pull connector for (2) alarm input and (2) alarm output.
			23. Operating Conditions: -40 to 122 degrees F; 0 to 95 percent RH.
			24. Security: Password protection, IP address filtering, HTTPS encryption, IEEE 802.1x network access control.
			25. Power: 24 to 34 VDC max 25.5W; power over Ethernet IEEE 802.3at.
			26. Accessories: Mounting plate, polycarbonate transparent cover. Provide ceiling, pendant or wall bracket mounting and connector kits.
			27. Basis of Design: Indoor, Avigilon #2.0C-H5A-PTZ-DP36 (2MP).

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**NOTE TO SPECIFIER**

In applications where multiple fixed cameras are mounted in the same location and are positioned to view different areas, gates or doors, a multi-sensor camera equipped with individually configurable camera sensors may be utilized as a design alternative. Applications would include employee parking areas, vehicle gates, the retail store, etc. Specifier shall include paragraph 2.5 E. for those applications.

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* + 1. Indoor/Outdoor, multi-sensor, fixed dome camera shall be 3 mega pixel (each sensor), 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 four individually configurable camera sensors that can be individually positioned to monitor large areas.
			2. Be equipped with a 10BaseT/100BaseTX Ethernet interface.
			3. Include a vandal proof resistant casing with fan and heater.
			4. Equipped with pixel counter.
			5. Image Sensor: 1/2.8 inch progressive scan CMOS (per sensor).
			6. Lens: Varifocal, 2.8mm (F1.2) to 4mm (F1.6); (per sensor).
			7. Angle of view: 103 to 72 degrees horizontal.
			8. Minimum Illumination:
				1. Color (2.8mm): 0.25 LUX @ F1.2.
				2. BW (2.8mm): 0.005 LUX @ F1.2.
				3. Color (4mm): 0.05 LUX @ F1.6.
				4. BW (4mm): 0.01 LUX @ F1.6.
			9. Shutter time: 1/8000 to 1/8s.
			10. Video compression: H264 (MPEG-4 part 10/AVC) baseline, main and high profiles, motion J‑PEG.
			11. Resolutions: 2048 x 1536 (3 MP).
			12. Frame rate:
				1. 20 fps (4x image sensor).
			13. Video Streaming: Multiple motion J-PEG, multi-stream H264 and multi-stream H265.
			14. Support Power over Ethernet according to IEEE802.3af.
			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 and NEMA 4X, IK10+ impact resistant stainless-steel casing with polycarbonate hard-coated dome and integrated humidifying membranes. Smoke transparent cover.
			21. Processor and Memory: 512 Mb RAM, 256 Mb Flash.
			22. Connectors: RJ45 10 BASE – T/100BASE-TX PoE terminal block for (1) alarm input and (1) alarm output.
			23. Power: Camera with built in fan and heater, 24 to 34 VDC, max 26 Watts, PoE (IEEE802.3af) class 2.
			24. Operating Conditions: -40 to 140 F, Humidity 10 to 95 percent RH (non-condensing).
			25. Accessories: Outdoor, weather shield, cable shield, 16 -foot network cable with pre-mounted gasket. Provide pole attachment where indicated.
			26. Basis of Design: Avigilon #12C-H4A-4MH-360 (4 Sensor).
		2. Products shall utilize internal or external surge protection such that a normally occurring power surge shall not void any manufacturer’s warranty.
		3. 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.
	1. VIDEO MONITORS
		1. Provide 21.5-inch LCD flat-panel color monitors with the following minimum capabilities.
			1. Product Requirements:
				1. Video Interface Connections: HDMI – 1 in, VGA – 1 in, Audio – 1 in, Audio – 1 out.

Switching between inputs shall be performed using a front panel control.

VGA resolution shall be equal to the native resolution of the installed Digital Video Recorder, if applicable.

* + - * 1. Input Power: 120VAC, 60Hz (a power adaptor may be used to provide this voltage).
				2. 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.
				3. Operating Temperature: Range shall be equal to or greater than 0 to 40 degrees Celsius.
				4. Humidity: Withstand a minimum of 20% to 80% humidity.
				5. Resolution: 1920 x 1080 SXGA.
				6. Pixel Pitch: 0.2482 x 0.2482 mm.
				7. Brightness: 250 cd/m2.
				8. Contrast Ratio: 1000:1.
				9. Backlight Type: LED BLU.
				10. Panel Aspect Ratio: 16:9.
				11. Warranty: 3 years – parts/labor.
				12. Adjustments: Must support on-screen display for setup and adjustment of monitor parameters.
				13. Colors: Must support a minimum of 16.7 million colors.
				14. Basis of Design: Orion #22RCE.
				15. Alternate Models:

Orion #22RDHY

Orion #23REDE

* + 1. The contractor shall 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.
	1. CAMERA POWER SUPPLIES
		1. Based on the Construction Documents, the Direct Vendor will identify camera power source. When required the Direct Vendor will provide power supplies for camera.
		2. Interior Fixed Cameras: Camera shall be powered by PoE from local 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.
		3. Interior and Exterior PTZ Cameras (non “Blue Sky”): Camera shall be powered by PoE from local 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.
		4. Exterior Building Wall Mounted Fixed Cameras (non “Blue Sky”): Camera and enclosure shall be powered by PoE from local 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.
		5. Exterior Fixed 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.
		6. Cameras requiring cable runs in excess of 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.
		7. 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. There are two options for providing power to the cameras:
			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. Provide circuit breakers equipped with padlockable, handle attachments in the panelboards that contain surge protection and do not supply motor loads. These handle attachments must be capable of padlocking in the “on” or “off” position. Circuit breaker trip function must remain operational when locked in the ON position.
			3. 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.
		8. 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.
		9. Enclosures housing camera power supplies, media converters, fiber patch box and 120 Volt receptacles shall contain interior back planes for mounting of all components and shall be provided by the General Contractor. NEMA type 4X, 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. VIDEO CAMERA HOUSINGS AND MOUNTS
		1. Direct Vendor shall 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:
				1. 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.
				2. All housings shall be sufficiently dust and moisture resistant to withstand normal environ-mental conditions in their chosen installation location.
				3. 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.
				4. Where used, 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. General Contractor shall furnish and install 1-1/2 inch pipe to pendant kit at each camera length as required
				5. 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.
				6. The General Contractor shall terminate the Ethernet and fiber optic cabling to the patch panels provided by the Direct Vendor and located in the node cabinets or headend racks.
			2. Exterior Cameras:
				1. Environmental: Thermostatically controlled heaters and blowers with defrosting capabilities.
				2. Moisture: Rainproof seals and gaskets.
				3. Wind Resistance: Rated for 80 mph sustained winds, minimum.
				4. Ambient Temperature Rating: -22 to 131 degrees F.
				5. Areas with more demanding environmental conditions will be granted a deviation from this specification.
				6. Exterior building mounted cameras shall be provided with surge protection at the camera and at the node or headend.
				7. 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.
	3. FIBER OPTIC MEDIA CONVERTER MODULES
		1. Direct Vendor shall provide fiber optic transmitters, receivers and associated power supplies.
		2. 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).
				1. Building wall mounted cameras and 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.
		3. 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 Injector for both fixed and PTZ 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.
		4. Fiber receiver modules located at the node or headend 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.
		5. Fiber optic modules shall conform to the following minimum specifications:
			1. 10/100 MBps RJ-45 Ethernet port, SC Fiber Port.
			2. 62.5/125, OM1, 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.
		6. Remote Node Cabinet
			1. Remote Node Cabinet shall be lockable and will house an IP video system network switch, patch panel, UPS and camera power supply.
				1. The GC shall install the remote node cabinet and terminate fiber optic and category 6 cables.
				2. Direct Vendor will supply line-interactive, rack mounted UPS with battery reserve rated to supply the continuous load for 18 minutes.
				3. The GC shall provide a dedicated 20 Amp, 120 Volt circuit for each remote node cabinet.
			2. 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.
			3. Interior cable runs from remote node cabinets to the CCTV headend rack shall be 6 count, 62.5/125, OM1, indoor rated fiber cable contained within innerduct; utilize plenum rated where required (General Cable #CG0061PNR or #CG0061PNU). Note that armor jacketed fiber cabling, if utilized, need not be contained within innerduct.
		7. Patch Cables
			1. Direct Vendor will provide fiber optic patch cables for patched connections within the node cabinet.
	4. MIDSPAN INJECTORS / ETHERNET CABLE EXTENDERS
		1. Direct Vender shall provide Ethernet Midspan Injectors and Cable Extenders as required.
		2. Cable Extenders, or fiber optics, shall be used at the discretion of the design engineer or when one or more of the following conditions are met:
			1. Camera cable runs exceeding 300 feet shall be fiber optic.
			2. When adding or replacing cameras to an existing CCTV system, camera total cable lengths (including horizontal and vertical distances) in excess of 300 feet and no more than 800 feet may be equipped with Ethernet cable extenders.
		3. 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.
		4. Midspan injectors located at the headend and node cabinets are standalone modules mounted within the equipment rack.
	5. CABLING
		1. 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); utilize plenum rated where required.
			2. Interior cable runs exceeding 300 feet from cameras to node cabinets or to the CCTV headend shall be (2) count 62.5/125, OM1, multimode, indoor fiber cable; utilize plenum rated where required.
			3. Exterior cable runs routed to remotely located “blue sky” cameras shall be (2) count, 62.5/125, OM1, 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. Where individual fiber cables are routed within a common conduit, innerduct separation shall be provided for each cable.
			4. Interior cable runs from remote node cabinets to the CCTV headend rack(s) shall be (6) count, 62.5/125, OM1, multi-mode, indoor rated fiber cable contained within innerduct; utilize plenum rated where required. Note that armor jacketed fiber cabling, if utilized, need not be contained within innerduct.
			5. All exterior category 6 and fiber cable runs shall be contained in conduit or an approved raceway.
		2. Camera Ethernet Data Cabling:
			1. 4-Pair Category 6 Unshielded Twisted Pair Cable shall be provided and installed by the General Contractor.
			2. The General Contractor shall 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. The General Contractor shall terminate and test the category 6 cable and RJ45 jacks.
				1. Basis of Design: Belden #AX104210 (coupler jack).
				2. 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.
		3. 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.
		4. Cable shall have footage markings to Identify CCTV system cable lengths.
		5. Fiber Optic - When fiber optic modules are required, the General Contractor shall provide fiber optic cable appropriate for the application. Cable shall conform to the following specifications:
			1. 62.5/125, OM1, multimode, indoor rated fiber.
			2. 62.5/125, OM1, multimode, indoor/outdoor, plenum rated fiber.
			3. “SC” 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.
			7. Fiber cabling not routed within conduit shall be encased within appropriately sized inner ducts; utilize plenum rated where required.
			8. The general contractor shall terminate and test the fiber optic cable and connectors.
			9. Fiber distribution, patch boxes (interconnect centers) shall be provided within NEMA 4 enclosures at the pole mounted, blue-sky type cameras for termination of the fiber cabling.
				1. Fiber patch box shall be (6) port complete with adapter plate, “SC” connectors, splice tray, protection sleeves and enclosure, and shall be provided by the General Contractor.

Basis of Design: RLH Industries #PWSN-A-1 (Slimline patch panel: 4 inch W x 5 ½ inch H x 2 inch D.

Alternate U.S. manufacturers permitted.

* + - 1. Fiber cabling shall be well managed and protected and never directly connected to any camera device or component.
			2. Fiber patch boxes (interconnect centers) shall be equipped with covers, so the fiber strands are not exposed.
			3. Cap all unused fiber ends to maintain cleanliness and avoid physical damage; all fiber strands are to be terminated.
			4. Clean out any metal shavings or other debris from the enclosure.
			5. Do not run fiber strands through any brackets or around other cables
			6. Label each fiber cable with to/from destination. Attach a panel label to the inside of the patch panel cover.
			7. Allow access to optical fiber cabling for testing.
			8. Protect connections against accidental contact with foreign objects that may disturb optical continuity.
			9. Properly handle optical fiber cables and patch cords and promote their orderly management.
			10. 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, 62.5/125, OM1, multimode, indoor riser rated fiber optic (General Cable #CG0021PNR or Approved Equal) | Camera Data | Interior (non-plenum) camera cable runs exceeding 300 feet. See Sections 2.9 and 2.13 |
| (2) Count, 62.5/125, OM1, multimode, indoor plenum rated fiber cable (General Cable #CG0021PNU or Approved Equal) | Camera Data | Interior (plenum) camera cable runs exceeding 300 feet. See Sections 2.9 and 2.13 |
| (6) Count, 62.5/125, OM1, multimode, indoor riser rated fiber optic (General Cable #CG0061PNR or Approved Equal) | Data | Interior (non-plenum) cable runs – node cabinets to headend. See Sections 2.9 and 2.13 |
| (6) Count, 62.5/125, OM1, multimode, indoor plenum rated fiber cable (General Cable #CG0061PNU or Approved Equal) | Data | Interior (plenum) cable runs – node cabinets to headend. See Sections 2.9 and 2.13 |
| (2) Count, 62.5/125, OM1, multimode, indoor/outdoor, plenum rated fiber optic (General Cable #CG0021ANU.BK or Approved Equal) | Camera Data | Exterior cable runs to “blue sky” cameras. See Sections 2.9 and 2.13 |
| Category 6 riser rated cable with footage markings (purple) (General Cable 7133809 or Approved Equal) | Camera Data | Interior (non-plenum) camera cable runs less than 300 feet. See Section 2.12 |
| Category 6 plenum rated cable with footage markings (purple) (General Cable 7131809 or Approved Equal) | Camera Data | Interior (plenum) camera cable runs less than 300 feet. See Section 2.12 |
| Category 6 “OSP” rated cable with footage markings (black) (General Cable 7136100 or approved equal) | Camera Data | Exterior final cable runs (50 feet maximum) to cameras. See Section 2.12. |

* 1. CATEGORY 6 CABLING
		1. 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 - Preferred
			5. Leviton
			6. Ortronics (Legrand)
			7. Panduit
			8. Product options and substitutions. Substitutions: Permitted if approved by Direct Vendor and Manufacturer.
		2. Conductors: 4 twisted pair, minimum 23 AWG, solid copper.
			1. Individually insulated plenum rated conductors under common plenum rated sheath unless entire area where cable is installed is not considered a return air plenum according to any applicable codes. 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. OM1 FIBER CABLING
		1. 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 - Preferred
			6. Leviton
			7. Optical Cable Corp.
			8. Ortronics (Legrand)
			9. Superior Essex
			10. Product options and substitutions. Substitutions: Permitted if approved by Direct Vendor and Manufacturer.
		2. Conductors: 2 / 6 strand
			1. Provide multi-strand, 62.5/125 micron, tight-buffered, multimode, OM1 fiber cabling rated as follows:
				1. 1 Gb/s < 150m @ 850 nm.
				2. 1 Gb/s < 1000m @ 1300 nm.
			2. The fiber cabling shall meet the following specifications:
				1. EIA/TIA-492AAAA-A-1997, “Detail Specification for 62.5 micron Core Diameter/125 micron Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers.”
				2. IEC 60793-2-10, “Product specifications – Sectional specification for category A1 multimode fibers”, Type A1b 62.5/125 micron graded index fiber.
			3. Terminate fiber strands onto “SC” ports.
			4. Provide individually insulated plenum rated strands under common plenum rated sheath, unless entire area where cable is installed is not considered a return air plenum according to any applicable codes.
			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 contained within innerduct.
			7. All exterior or underground fiber cable shall be indoor/outdoor, plenum rated. Provide indoor/outdoor, “OSP” rated, fiber patch cords for exterior applications.
	3. SECONDARY BONDING BUSBAR – SBB BEHIND HEADEND (REFER TO TIA-607-D)
		1. 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 TMGB
			2. Chatsworth – P/N CPI 13622
			3. Legrand – P/N OR-GB2X12TGB
			4. Product options and substitutions. Substitutions: Not Permitted.
		2. 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 PBB using minimum #1/0/AWG/CU bonding conductor. Minimum size will be 2 inch H x 0.25 inch W x 12 inch L.
		3. Each headend rack shall be bonded to the SBB using a #6/AWG/CU stranded bond wire.
		4. Each 2-lug compression connector shall have antioxidant coating applied to lug and busbar prior to attachment.
	4. ACCESSORIES
		1. 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.
		2. The headend equipment rack shall utilize a standalone UPS sized for a minimum of 10 minutes of battery run-time. The UPS shall be provided by the Direct Vendor. General contractor will 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 #SMART3000RMXL2U.
			2. Provide quad-plex Telecommunications Outlet (T/O) bottom mounted at 24 inch AFF behind the headend rack.
		3. Upright Racks: The Direct Vender shall provide and install 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 inch vertical spacing of equipment. Rack rails shall be punched with captive nuts, 10-32 screws and nylon washers.
		4. The General Contractor shall terminate the ethernet and fiber optic cabling to the patch panels provided by the Direct Vender and located in the upright racks.
	5. CCTV TERMINAL CABINETS
		1. 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 in excess of 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.
		2. CCTV terminal cabinets shall not contain ePACS components. The CCTV system shall utilize independent wiring, raceways and cabinets.
		3. 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. Terminal cabinets shall be provided by the General Contractor.
		4. 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.
		5. 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.
		6. 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.
		7. Exterior terminal cabinets shall be equipped with a copper ground bus bonded to a driven ground rod using #2/AWG copper grounding electrode conductor.
1. EXECUTION
	1. EXAMINATION
		1. Section 017300 - Execution: Verification of existing conditions before starting work.
		2. 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.
		3. 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.
		4. By beginning work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Postal Service.
		5. Provide required power outlets, low voltage power supplies, interconnecting cables, hardware and equipment for a complete and operable system.
		6. 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.
	2. INSTALLATION
		1. Install all equipment in accordance with Direct Vendor’s published instructions. Installation must be done by the Direct Vendor 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.
				1. Rack mount screws shall be self-centering Philips-head configuration unless specialized tam-per-resistant hardware has been specified.
				2. 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 se-cured 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 break-outs 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 Direct Vendor's 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.
				1. 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. The camera numbering system chosen shall be utilized by the A/E during preparation of the design drawings and by Securitas in preparation of their construction drawings to provide consistent, matching and accurate as-built documentation.
				1. Each pendant or arm mounted, PTZ camera shall be labeled on three sides with 3 inch high numbers supplied by the Direct Vendor.
				2. Each ceiling, wall or pendant mounted, multi-sensor camera shall be labeled on three sides with a 1 inch high numbers supplied by the Direct Vendor.
				3. Each ceiling, standard, wall or pendant mounted, fixed camera shall be labeled on two sides with 1-1/2 inch high numbers supplied by the Direct Vendor
				4. The outer shroud of each wall or pole arm mounted, fixed camera shall be labeled on two sides with 2 inch high numbers supplied by the Direct Vendor.
				5. The flange of each recessed ceiling mounted PTZ, fixed or multi-sensor camera shall be labeled on two sides with 1 inch high numbers supplied by the Direct Vendor.
				6. Labeling shall be stenciled or laminated vinyl in a contrasting color to the camera housing.
				7. 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 guy-wires 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 Direct Vendor redlined drawings with job condition changes required to provide accurate close-out documentation.
		2. Power requirements shall be determined by actual equipment used.
		3. 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.
		4. Arrange all components to be mounted in the rack(s) in accordance with Direct Vendor and/or Postal Service provided System Elevation drawings. Design shall provide a neat appearance and accessibility for servicing equipment.
		5. 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.
		6. 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.
		7. All category 6 cable connections must be made to 8 pin coupler jacks at the device and to 8 pin, feed-thru coupler jack patch panels at the head end or node cabinets per T568A standard. Patch panel shall be terminated per Direct Vendor.
			1. The category 6 CCTV cabling shall be equipped with an RJ45/category 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 category 6/RJ45 male jack. Terminations provided by the General Contractor.
			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. The feed-thru coupler jack patch panels (complete with the coupler jack modules) shall be provided by the Direct Vendor.
		8. 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.
			2. Cable tray for camera wiring shall not include any low voltage AC wiring.
			3. Interior fiber optic cabling shall be contained within innerduct.
		9. 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. DOCUMENTATION
		1. The Contractor shall 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.
	4. FIELD TESTING CATEGORY 6 COPPER AND FIBER OPTIC CABLE
		1. Section 014000 – Quality Requirements: Field testing and inspection.
		2. 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.
		3. Category 6 Copper Cable Testing:
			1. Use Level III Compliant test equipment.
			2. Test parameters shall include:
				1. Wire map.
				2. Insertion loss (attenuation).
				3. DC loop resistance.
				4. Return loss at camera.
				5. NEXT, NEXT at camera.
			3. Perform end-to-end tests of each 4-pair cable as follows:
				1. Pair/conductor for proper pinouts and continuity.
				2. Ground fault.
				3. Proper termination, shorts, and crossed pairs.
				4. Channel attenuation per TIA-568-C, including all addendums.
				5. Channel bi-directional worst case near end cross talk (NEXT) at frequencies up to 250 MHz, per TIA-568-C, including all addendums.
				6. Measured effective cable run length.
		4. Fiber Optic Testing:
			1. Use 62.5/125 micron, OM1, 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 850 nm and 1300 nm.
			4. The fiber testers and test heads shall have passed calibration within one year of actual test date.
			5. Tests include:
				1. Tier 1 Testing with Optical Loss Test Set (OLTS) that includes testing for length.
				2. Tier 2 Testing with OTDR to show all splices.
	5. CONSTRUCTION COORDINATION
		1. The Direct Vendor shall interface with Other Work
	6. FIELD QUALITY CONTROL
		1. Section 014000 - Quality Requirements: Inspection and testing procedures.
		2. Inspection:
			1. The Direct Vendor shall inspect equipment installation, interconnection with system devices, mounting locations, and mounting methods.
			2. The Direct Vendor shall verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.
		3. Testing:
			1. The Direct Vendor shall 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. The Direct Vendor shall provide an actual demonstration of each system function.
			3. The Direct Vendor shall 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.
			4. The Direct Vendor shall use accepted Checklist for system testing.
			5. The Direct Vendor shall 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.
			6. 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.
			7. Perform all tests in the presence of the Postal Service Project Manager. The Postal Service reserves the right to accept any portion or activate any phase prior to acceptance of entire system.
	7. CLEANING AND ADJUSTING
		1. Adjust manual lens irises to meet lighting conditions.
		2. Adjust field of view for each camera per USPS Project Manager direction.

END OF SECTION

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