

Description:

The purpose of the section is to highlight the current applicable UMCP Design Standards for the design and installation of Security Camera/Closed-Circuit (CC) TV systems

Related Sections:

- Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I Specification Sections of the Contract, apply to this Section.

Effective Date:

December 2, 2002

Applicable Standards:

- Comply with NFPA 70.
- Comply with 47 CFR 15, 17, and 76
- Underwriters Laboratory
- All fixtures shall bear UL Wet Location and I.B.E.W. labels

General Requirements:

This Section includes furnishing of equipment and installation of a CCTV System for the University of Maryland. The new camera system shall interface with the existing Pelco CCTV system and all cameras shall connect to the existing Pelco Video CM9760 Matrix Switcher. Contractor shall be responsible for installation and programming of any cameras to this system. Contractor is responsible for the supply and installation of any video input/output cards, switching bay boxes, or any other head end equipment required to expand the existing system and provide the university with a fully operational CCTV system. The contractor shall provide all wiring, fiber and electrical power, to provide control of pan/tilt/zoom cameras and all CCTV equipment.

• Submittals

- **Product Data:** Include detailed manufacturer's specifications for each component specified. Include data sheets reflecting the model numbers, features, ratings, performance, power requirements, and dimensions.
- **Shop Drawings:** For CCTV equipment to include plans, elevations, sections, details, and attachments to other Work.
 - Include dimensioned plan and elevation views of components and enclosures. Show access and workspace requirements. Shop drawings shall include mounting details for all wall and pole mounted equipment. Such details shall include all mounting brackets, hardware, and connections to the building and pole structures.
 - **Wiring Diagrams:** Power, signal, and control wiring point-to-point diagrams. Differentiate between manufacturer-installed and field-installed wiring.
 - It is the Contractors responsibility to submit for approval the complete designed system configuration and layout showing all devices, wiring, conduit, and locations along with other required information as specified herein for the completely integrated system proposed for installation.
- **Coordination Drawings:** Plans drawn to scale and coordinating locations of CCTV equipment. Show the following:
 - Method of attaching hangers to building structure.
 - Location of items requiring installation coordination including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and other architectural features.
- **Samples:** Provide full size samples of each outlet; finish plate, for colors and textures required.
- **Product Certificates:** Signed by manufacturer of CCTV equipment and components certifying that products furnished to the Contractor comply with requirements.

- **Installer Certificates:** Signed by manufacturer certifying that installers comply with manufacturers requirements.
- **Field Test Reports:** Indicate and interpret test results for compliance with performance requirements of installed systems.
- **Maintenance Data:** Maintenance Data for CCTV equipment and components shall be a part of the maintenance manuals specified in Division 01. In addition to requirements specified, to be provided include the following:
 - Detailed operating instructions covering operation under both normal and abnormal conditions.
 - Routine maintenance requirements for system components.
 - Lists of spare parts and replacement components recommended are to be stored at the site for ready access.
 - **Warranties:** Special warranties specified in this Section.
- **Calculations and Parameters;** Contractor shall submit for approval by University of Maryland, Building Security Systems, the calculations used and plans and diagrams for the Field of View calculations for the CCTV system. Submission as a minimum shall include and address Low Level Lighting. Backlight compensation, and Lens conformance with this Specification.
- **Quality Assurance**
 - **Installer Qualifications:** This project requires an experienced installer with a minimum of five (5) years experience installing CCTV equipment and should possess the manufacturer's certification, for both installation and maintenance of equipment required for the project.
 - **Product Options:** Drawings shall indicate size, profiles, and dimensional requirements of surveillance equipment and are based on the specific system indicated. Other manufacturers' products complying with requirements may be considered.
 - **Electrical Components:** Devices, and Accessories; Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - **UL Compliance.**
 - Comply with applicable requirements of UL safety standards pertaining to television equipment and accessories.
 - Provide TV equipment and accessories, which are UL-listed and labeled.
- **Project Conditions**
 - **Environmental Limitations:** System components shall be equipped and rated for the environments where installed
 - **Service Conditions for Outdoor Equipment:** Rate equipment for continuous operation under the following environmental conditions, unless otherwise indicated:
 - **Temperature:** Minus 15° F to plus 122° F.
 - **Relative Humidity:** 5 to 100 percent.
 - **Weather:** Enclosure housings to prevent entry of moisture due to melting ice build-up or driven rain or snow.
 - **Service Conditions for Indoor Equipment:** Rate equipment for continuous operation under the following environmental conditions, unless otherwise indicated:
 - **Temperature:** 32° deg. F to 140° F.
 - **Relative Humidity:** 0 to 95 percent.
- **Coordination**
 - Coordinate layout and installation of CCTV surveillance equipment and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

- **Warranty**
 - Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
 - Special Warranty for Surveillance System and Components: Written warranty, signed by manufacturer and Installer agreeing to correct system deficiencies and replace components that fail in materials or workmanship within specified warranty period when installed and used according to manufacturer's written instructions.
 - This warranty shall be in addition to, and not limiting, other rights Owner may have under other provisions of the Contract Documents
 - Special Warranty Period: Two years from date of Substantial Completion
 - Technical Assistance: CCTV equipment manufacturer shall provide a 24-hour technical telephone assistance program, allowing for the communications directly with manufacture employees to answer any questions and resolve problems over the telephone on a 24-hour basis
 - Repairs: Manufacturer shall provide 24-hour repair and turn around service on all CCTV equipment
 - This section applies to security cameras accessories and equipment.
- **Equipment Requirements**
 - Design, furnish and install the camera system equipment and layout in conformance with IES recommended procedures. All CCTV system components are to be new, unused products provided with complete Manufacturer's and Contractor's warranty of no less than two years Parts and Labor service. All of the equipment to be furnished is to interface and directly connect to the existing Pelco CCTV equipment in place. Code converter boxes or translator equipment will not be acceptable
- **Wiring**
 - The wiring system shall consist of tying into owner supplied multimode fiber, running from the new construction site to University of Maryland, Building Security Systems in Building 10. The fiber transceivers shall be supplied by the contractor and will need to be coordinated for the type based on the cameras in the new building site and shall be American Fiber Tech products to integrate with the existing fiber backbone.
- **Lighting**
 - Contractor will assure that adequate area lighting exists to allow for the proper viewing of the video images in the viewing area. This may be accomplished by use of the appropriate combination of cameras, lenses, environmental enclosures, and mounts, as well as, the possible addition of exterior lights. Metal Halide is the preferred exterior lighting source
- **Parking Garage**
 - Cameras installed within parking garages will conform to the general requirements listed above for cameras, lenses, environmental enclosures, mounts and lighting. In locations where the pendant mount camera suspends below the concrete beam, structure a breakaway mount shall be used to keep from destruction to the camera unit or a vehicle.
- **Project Record Documents**
 - Accurately record actual locations of each camera with the switching arrangements and provide the University with accurate As-built plans within 30 days of contract closeout.
- **References**
 - Poles - Shall conform to University of Maryland standard poles or PERT Telephone (Police Emergency Reporting Telephone) Installation Criteria 4.15.97 for Free Standing Talk-a-Phones with Camera Extensions.

- Building exterior shall be a mountable surface capable of bearing a shear weight of 100 lbs.
- **Qualifications**
 - Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.
- **Exterior Equipment And Accessories**

Equipment supplied shall be compatible with existing Pelco CCTV equipment, code converter boxes or translator equipment will not be acceptable.

 - Environmental enclosures complete with gaskets, to form weatherproof assembly.
 - Low temperature operation to zero degrees Fahrenheit.
 - Camera enclosure shall be vandal-proof.
 - Transceivers supplied shall be compatible with existing equipment.
 - Camera's mounted on parapets must not be mounted on false parapets.
- **Camera Equipment And Accessories**
 - Internal Wiring: Component wiring within enclosures shall be UL Listed.
 - Digital Video Multiplexer:
 - The video multiplexers shall be a 16-camera input, color, full duplex system. The multiplexer will allow for simultaneous time base corrected digital recording of all cameras to VCR's in a full screen format. Recording shall be accomplished in a field recording sampling method.
 - The multiplexer shall offer live selectable multi-screen displays while recording. The video multiplexer shall allow any input to be programmed into any display location: PIP (programmable for size and location on screen), quad (2x2), nine cameras (3x3), and sixteen cameras (4x4). The video multiplexer shall allow sequencing of at least four different Quad (4x4) displays and at least two different nine (3x3) camera displays.
 - The video multiplexer shall have three monitor outputs, one for full and/or multi-camera viewing in live or playback modes, one for full screen viewing of live cameras, and one for automatic sequencing of full screen live cameras. All three monitors shall be capable of automatically displaying cameras in alarm and/or cameras that have detected activity. The multiplexer shall provide a digital zoom display in full screen, in live and playback modes. The video multiplexer shall have an automatic speed-tracking mode that allows the VCR's recording speed to automatically adjust and control the multiplexer's record speed via the VCR's head switching pulse.
 - The unit shall feature programmable, digital activity detection on all video channels. Digital activity detection shall provide programmable detection mask and sensitivity levels for each camera.
 - The multiplexer shall be capable of control of up to sixteen (16) pan-tilt-zoom cameras when wired in a daisy-chain configuration.
 - All video communications between the CPU's, the VCR's, and the monitors will be transmitted via RS485 connector to a CM9760-CDU or approved equal.
 - Color Duplex Multiplexers shall be Pelco Model MX4016CD or approved equal.
 - **VCR's**
 - Each VCR will be a time lapse VCR capable of recording in standard 6 and 8 hour recording modes and time-lapse recording modes for 18, 24, 30, 40, 54, 72, 78, 102, 104, 126, 136, 160, 174, or 232 hours dependent on type of tape. The VCR shall have a resolution of 400 lines in super resolution mode and more than 240 lines in VHS mode. The VCR shall have four rotary heads and utilize one rotary head for audio recording. The VCR shall have three direct drive motors. Search functions shall be made by time and date, alarm index, Skip, and counter memory stop. The unit shall have a jog/shuttle for easy forward or reverse field playback. The VCR shall be Pelco Model TLR3168 or approved equal. The VCR's shall be rack mounted in a 19" console with a Pelco RM-2001 Rack Mount Kit.

- **Monitors**
 - Each multiplexer will be equipped with both a main and a spot monitor. These color monitors are to have 18" diagonal viewing areas. Resolution shall be a minimum 900 TV lines. Audio inputs, speakers, and looping BNC video inputs are to be available. Separate S-VHS inputs will be available for future requirements. The monitors shall be Pelco Model PMC21A Monitors or approved equal. Monitors are to be mounted as requested by the University.

- **Interior Pan/Tilt/Zoom Color Dome Cameras**
 - Each interior pan/tilt/zoom (PTZ) color camera shall be recessed and secured to the beam structure of the building or the University may opt for corner mounted or wall mounted units. All cameras that are recessed will be required to have the domes at ceiling level. It is the contractor's responsibility to coordinate the camera type and lens requirements with the University before the purchase of the cameras as stated in submittals above. The contractor shall refer to the camera schedule and drawings for installation location and type. The cameras shall be Pelco Model Spectra III SE or approved equal.

- **Exterior Pan/Tilt/Zoom Color Camera systems**
 - The exterior PTZ color cameras shall be mounted as required by the manufacturer and conform to University standards. The pan/tilt/zoom system shall have the receiver driver unit as an integral part of the unit. Separate receiver drivers are unacceptable. The camera shall be an integral part of the housing and be installed by the manufacturer and possess low light technology and utilize a 1/3" CCD imaging device with picture elements of a minimum 768 (H) x 494 (V) and a total of 480 TVL minimum. The camera shall have a minimum 0.023-lux at 35 IRE, f1.2 minimum illumination. Contractor shall coordinate the lens requirements with the University of Maryland, Building Security Systems before purchasing any unit. The Pan/tilt/zoom camera shall be a Pelco Model Esprit ES30CBW18-5W or approved equal.

- **Interior Color Fixed Cameras**
 - The interior fixed color cameras shall be an integrated camera system consisting of surface and in ceiling mounted units. The fixed camera systems shall be color hi-resolution cameras with variable focus lenses, utilizing 1/4 inch CCD imaging devices with a horizontal resolution of 480 TV Lines and have a Signal-to-Noise ratio of at least 48dB and have a minimum illumination sensitivity of 1.2 lux. The fixed color cameras shall be Pelco Model ICS Series Cameras 100, 150, 200, or 300 or approved equal.

- **Console and Playback Stations**
 - When necessary a complete security console with provisions to rack mount all recording, control, and display equipment will be provided for.
 - A complete playback station will be provided. This workstation will consist of Pelco MX4016CD Multiplexer, TLR3168 VCR and PM21A Monitor or approved equals. The playback/review station shall include a Toshiba 6A Printer Model EC 1200A or approved equal. The printer must also use print paper Model ECA-AGN or approved equal. This system shall allow for the offline review of any archived recorded video from the System with selectable, individual playback of multiplexed cameras.

- **Labels:** All fixtures shall bear UL Wet Location and I.B.E.W. labels.

- **Lens**
 - Lens-I (Exterior Domed Sites), the complete camera/lens/connector package must be compact enough to fit internally into the Environmental Dome. The exterior domed site shall have 64 presets built into the dome unit. The zoom lens shall be a minimum 16x auto-iris with a minimum focal length of 4.0-64mm. Mechanical dimensions shall be such that the lens and camera combination

will fit in the enclosure with a 5.9" acrylic bubble. The domed system shall have 360-degree pan rotation and 180-degree auto flip dome rotation.

- Lens-2 (Free Standing Code Blue Sites), the complete camera/lens/connector package must be compact enough to fit internally to the Free Standing Code Blue Telephone enclosures, which are approximately 11" in diameter. The zoom lens shall be an auto-iris with a minimum focal length of 4.0-64 mm.
- Lens-3 (ESPRIT), the complete camera/lens/connector package must be compact enough to fit internally into the Environmental Enclosure. The zoom lens shall be a 16x auto-iris with a minimum focal length of 3.9-63mm.
- **Environmental Enclosures**
 - All exterior camera sites are to be configured in an environmental enclosure, which incorporates a 360-degree rotation pan and tilt devise to allow for camera viewing in all directions from the camera site location. Two types of environmental enclosures shall be utilized.
 - Enclosure-1 (The Exterior Domed Sites enclosure) The enclosure shall incorporate a 5.9" lower hemisphere with a black opaque lower dome with a clear viewing slot. The environmental dome shall include factory installed heater and blower. The dome is to be powered by 24 VAC. The integral pan-tilt will be pre-wired for all system functions. The environmental dome shall be the Pelco Spectra III Series or approved equal.
 - Enclosure-2 (The ESPRIT Series Enclosure) The enclosure is to be powered by 110 VAC. The enclosure will be pre-wired for all system functions. The environmental enclosure shall include factory-installed heater. This heated enclosure system shall be a Pelco Model ESPRIT Series Positioning System with Integrated optics package or approved equal with wall mount and pole mount adapter where needed.
- **Mounts**
 - An appropriate mounting device will be provided at all camera locations to provide a stable and accessible means of access to the camera site. The specifics of each site location will be determined by local considerations at the indicated mounting location during the site walk-through.
 - When domes are mounted to on the roof of buildings, parapet mounts, which incorporate swinging arms for serviceability, shall be provided. Whenever possible, domes are preferred to be roof mounted as opposed to wall mounted, for maximum serviceability.
 - Typical building mounts shall be Pelco PP351 rooftop parapet mounts for Spectra series camera units or approved equal. Where pole mounted, the mounts, shall be Pelco IWM24 with a built in transformer for wall mounting the Spectra series cameras to a wall and pole adaptors with Pelco SWM-PA-GY or approved equal. Where corner mounts are to be used, the mount shall be Pelco SWM-CA or approved equal.
 - Other mounts are to be applied where required.
- **Splices, Taps**
 - All splices underground; in hand holes or other wet locations shall be waterproof and made with Scotch-cast 85 Multi-Mold Splicing Kits, or approved equal.
 - All taps shall use suitable connectors such as Burndy Type Ks and taped with two layers of 3M Scotch Brand or approved equal rubber tape and six layers of vinyl plastic electrical tape.
 - Splices in hand holes shall be supported on bricks 8 inches above the bottom of the hand hole. Splices shall be kept to a minimum and are prohibited in locations other than hand holes, pull-boxes or lighting unit bases, except for the purposes of retaining circuitry of any existing underground wiring where existing poles or wiring are distributed.

- **Examination and Preparation**
 - Examine adjacent surfaces to determine that surfaces are ready to receive work.
 - Examine each piece of equipment to determine suitability for location specified.

- **Installation**
 - Install camera equipment and accessories in accordance with manufacturer's instructions.
 - Install equipment in consoles and EIA Standard 19" Equipment Racks.
 - Connect equipment to the branch circuits and cables provided by Contractor.
 - Bond products and metal accessories to the branch circuit equipment-grounding conductor.
 - Equipment shall be located clear of equipment that will affect the field of view of the cameras. The University reserves the right to relocate any camera within 15 feet from locations shown on drawings at no cost to the University.
 - Open trenches shall not exceed 30 linear feet before backfilling. All trenching shall conform to National Safety Standards. Contractor shall be responsible for traffic control, backfilling, asphalt or concrete repairs to the roadway, driveways, or sidewalks. No trench shall be left open overnight. It is the contractor's responsibility to provide any steel plates to maintain traffic and vehicle access each day at job shutdowns. Contractor is also responsible for locating any utilities before trenching or digging begins.

- **Adjusting And Cleaning**
 - Adjust equipment as directed by the University Building Security Systems.
 - Clean paint splatters, dirt, and debris from installed equipment.
 - Touch up enclosures, buildings, and interior finish at completion of work.
 - Replace equipment and mounts, which have failed at completion of work.

- **Coordination**
 - Confirm compatibility and interface of other materials with CCTV system. Report discrepancies to the University Building Security Systems.
 - Supply trim rings, back boxes, etc. to other trades as necessary.
 - Coordinate with the Mechanical, and Structural Contractors to avoid conflicts between cameras, supports, fittings, and mechanical equipment.
 - Before ordering, confirm construction details and architectural finish for each area with the University Building Security Systems.

- **Acceptance**
 - Contractor shall demonstrate to the satisfaction of the University Building Security Systems that all equipment is operating properly. Any faulty equipment shall be replaced at the Contractor's expense. The Contractor shall demonstrate operation of all installed equipment.