PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

B. Division 16 Basic Materials and Methods sections apply to work of this section.

C. The contractor and equipment supplier shall review all project plans and specifications completely and be familiar with the requirements of the system.

1.2 DESCRIPTION OF WORK:

A. Furnish and install a complete Closed Circuit Television (CCTV) system as describe herein and as shown on the electrical plans, to be wired, connected, tested and left in first-class operating condition.

B. Coordinate and install required ancillary functions where shown on the electrical plans.

1.3 QUALITY ASSURANCE:

A. Manufacturer: Firms regularly engaged in manufacture of CCTV equipment and recording devices, of types, sizes, and electrical characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer: Qualified with at least 5 years of successful installation experience on projects with CCTV systems installation work similar to that required for this project. The installer shall be an authorized factory representative of the supplied equipment, and employ full time, factory trained technicians. Installer shall submit proof of current registration with the Tennessee Alarm Contractors Board.

C. NEC Compliance: Comply with NEC as applicable to construction and installation of CCTV system components and accessories.
D. UL Compliance and Labeling: Provide components which are UL-listed and labeled where required.

E. Supply all required components to cause operation of the system as specified shall be supplied and installed.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's data on all equipment, and cable, including, but not limited to, roughing-in diagrams and instructions for installation, operation and maintenance, suitable for inclusion in maintenance manuals.

B. Shop Drawings for systems provided under this section of the specification shall contain but not be limited to the following:

1. Specification data sheets on each individual system component.

2. Complete wiring diagrams for all devices and control panels.

3. Conduit layouts on project floor plans, including wire and cable types and counts in each conduit run.

4. Theory of operation and event matrix.

5. Battery calculations that substantiate requirement for a minimum standby operation of all CCTV systems and devices for a minimum of 4 hours. Also demonstrate ability of power supply/battery chargers to fully recharge battery sets in 12 hours or less.

6. Voltage drop calculations for any voltage outputs to ensure proper operating voltage at the device.

7. Test plans for all devices.

8. Training session plans including certifications of trainer, material to be covered, and tentative daily schedule.

C. Provide complete sets of as-built drawings to the owner including any deviations from the submittal data and shop drawings, complete programming, installation, operation, and maintenance information including all access codes and user data
D. Based upon submittal information, the Designer and representatives of the University of Tennessee shall be the sole authorities to determine equipment compatibility and compliance with the specifications.

E. Regardless of any other submittal requirements, 1 complete set of all shop drawings, submittal books, and As-built documents and drawings shall be delivered directly to the Facility Services Electrical Services Office, Facility Services Engineering Office, and Facilities Planning Office.

1.5 GENERAL PROVISIONS

A. All wiring shall be in conduit, 3/4” minimum, except for flexible device drops. Maximum conduit fill shall be 40%.

B. Each detection devices shall be wired, annunciated, and programmed as a separate and distinct input.

C. All wiring of any type leaving or entering the building shall be protected with surge arresters specified herein.

D. All AC inputs to power supplies and system components shall be equipped with surge arresters specified herein.

E. All cabinets shall be keyed alike. The University standard lock set is the C420A.

F. Control panel and all associated control and “head end” equipment, and power supplies shall be housed in a NEMA 1, steel cabinet sized to accommodate the equipment. Cabinet shall include screen protected air vents at the cabinet top and bottom. Plywood backboards (3/4” BC) shall be permitted. All backboards shall be painted to match the cabinet interior.

PART 2 - PRODUCTS

2.0 Digital Video Recorder

DVR (‘s) shall be provided and sized as shown in the specifications and drawings, or at a minimum, shall accommodate all cameras shown on the drawings plus a minimum of 2 spare video inputs. Digital video recorder shall be Crest Electronics CDVS-7516-640 or approved equal, with the following features as a minimum.
2.1 Digital Video Recorder 16 Channel, 480 fps, 640 Gigabyte

   A. 16 Video inputs with looping outputs and MPEG4 compression.

   B. 16 Channels of audio with 2-way communication available.

   C. Multi-zone motion detection per camera with zone sensitivity adjustment.

   D. Cool-Driven technology designed for high-intensity digital recording.

   E. 4CIF (720x480) resolution with real-time recording capability.

   F. 16 input sensors x 16 output controls.

   G. Quad-Plex technology to view live and recorded video simultaneously.

   H. Remote software will allow for administration of multiple DVR’s simultaneously.

2.1.2 Digital Video Recorder 8 Channel, 120 fps, 320 Gigabyte.

   Digital video recorder shall be Crest Electronics model CDVS-7308-320 or approved
   equal and shall have all other features of the 16 channel model.

2.1.3 Digital Video Recorder 4 Channel, 120 fps, 320 Gigabyte.

   Digital video recorder shall be Crest Electronics model CDVS-7304-320 or approved
   equal and shall have all other features of the 16 channel model.

2.2 Indoor CCD Camera Assembly

   A. The indoor/outdoor integrated CCTV camera and enclosure shall consist of a
      tamper/impact resistant, discreet, architecturally pleasing surface-mount enclosure
      with integrated fixed camera, lens, and low temperature resistor array. The indoor/outdoor
      integrated CCTV camera and surface-mount “track-light” style enclosure shall be the Pelco
      ICS300-CRV3A Camclosure or approved equal.

   B. The integrated camera and lens assembly shall consist of a charge coupled device
      (CCD) color camera with vari-focal lens with auto iris, that is mounted as an easily
      installable/ removable module.
2.3 Outdoor Camera Enclosure

A. The environmental camera enclosure shall consist of an indoor/outdoor camera housing designed specifically for use with medium and smaller format cameras and fixed focal length or motorized zoom lenses in moderate to severe climate conditions and shall include thermostatically controlled heater and continuously operating blower along with any accessories which may be required for a complete environmental camera enclosure.

B. The environmental camera enclosure shall be the Pelco EH3512-2 equipped with a EM3512 wall mount or approved equal.

2.4 Color CCD Camera and Lens

A. The DSP color CCTV camera shall consist of a 1/3” format CCD imaging chip.

B. The DSP color camera shall be a high resolution color camera with built-in RJ-45 connector for UTP or standard video output.

C. Color camera shall be equipped with a 2.5-6mm vari-focal lense

D. Color CCD camera shall be Pelco CC3710H6V2A or approved equal.

2.5 Color Pan, Tilt, Zoom Dome Camera

A. PTZ environmental dome system shall be Pelco Spectra III series SD53TC-PGE0, with UTP options or approved equal.

B. PTZ indoor dome system shall be Pelco Spectra III series SD53TC-SMB-0, with UTP options or approved equal.

C. Where shown of the drawings the camera dome shall be equipped with a remote programming station Pelco PS-RDPE-2. Unit shall include IPS-CABLE as required.

2.6 UTP Video Baluns and Hubs

A. Unless fiber optic connections are specified, all cameras with cable runs of less than 4900', shall be equipped with UTP conversion baluns and wired with standard Cat 5 cable as recommended by the balun manufacturer. Coaxial cable shall be used for patch cords only and as required to connect CCTV monitors,
switching equipment, etc.

B. Passive baluns shall be Crest Electronics CVB-121 or approved equal.

C. Active baluns shall be Crest Electronics CVB-301KT or approved equal.

2.7 High Resolution Color CRT Monitor

A. The high-resolution color video monitor shall have 450 horizontal lines at center and sized as shown on the drawings, (14” minimum).

B. Provide rack, wall, or ceiling mounting kits as required.

C. High resolution color monitor shall be Pelco PMC series or approved equal.

2.8 Camera Power Supply

A. The indoor camera power supplies shall allow for multiple cameras to be wired to a central power source. The power supplies shall consist of a metal can with a heavy-duty one hundred ten volt AC (110vAC) input to twenty-four volt AC (24vAC) step down transformer with a PC board with surge-protected individual wiring terminal outputs. The power supplies shall be available with four (4), eight (8), or sixteen (16) outputs. The power supplies shall utilize “Smartfuse” technology on each individual terminal. The Smartfuse shall be self-restoring, automatically unlatching when a transient is detected and resetting when the transient has passed. The Smartfuse shall be rated at one point eight five (1.85) amp. The metal can shall be of sufficient size to allow for easy wiring with multiple punch-outs for convenient wiring.

B. Provide and size power supplies as required and as shown on the drawings. Camera power supplies shall be Crest Electronics CPS-AC series or approved equal.

C. All cameras shall have separate, fused power circuits.

Part 3 - Execution

3.01 Provisions

A. Provide all miscellaneous hardware and items such as connectors, interconnect cables, fasteners, brackets, mounting adaptors, etc. to form a complete and functional system within the intent of this specification.
B. Provide all equipment, wiring, conduit and outlet boxes required for the installation of a complete and operating system in accordance with applicable local, state and national codes, the manufacturers' recommendations, these plans and specifications. Wiring shall conform to the practices in the National Electrical Code and the Manufacturers recommendation.

C. All CCTV system wiring shall be installed in conduit. Conduit shall be minimum 3/4”.

D. All system programming, camera focus, and aiming shall be fully coordinated with and approved by the system owner.

E. Full and seamless integration of the CCTV systems with themselves and other systems such as intrusion detection, access control, and intercom systems shall be included under this contract and accomplished by use of outputs and data interconnections of each control system.

F. All digital video recorders shall be equipped with local keyboard, mouse, and flat panel, LCD computer monitor (14” minimum).

3.1 INSTALLATION:

A. The University’s staff technicians and designers representative shall perform an inspection of the installation after written notice from the contractor that the installation is complete and ready for final aiming and focus.

B. Contractor shall be responsible for provision and installation of all system components, conduit and wiring.

C. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.

D. Wiring color code shall be maintained throughout the installation.

E. All installation will be in strict accordance with the Contract Documents, Manufacturers installation and wiring recommendations, the standards of the University of Tennessee, and all applicable local, state, and national codes and standards.

F. All aspects of the installation including device coverage patterns, adjustments, balancing, and programming will be closely coordinated with the University alarm room staff, and their maintenance technicians.
3.2 INSPECTION AND TESTING

A. The manufacturers' authorized representative shall provide as a minimum, final system connections, perform a complete functional test of the system, and submit a written report to the Designer attesting to satisfactory operation of the system.

B. Upon completion of the installation, four (4) copies of complete operational instructions and programming configuration as installed shall be furnished, complete with record drawings. Instructions shall include part numbers and names, addresses, and telephone numbers of parts source. Final payment shall not be made until operational and maintenance manuals have been received.

C. Final acceptance will be granted after completion of successful acceptance testing, presentation and submittal of instructions, and transmittal of Owner's & Service manuals.

D. Nothing herein contained shall be construed to relieve the Contractor from furnishing a complete and acceptable electrical wiring system in all its categories. The engineer will condemn and reject any materials or labor which are or may become detrimental to the accomplishment of the intents of these specifications.

E. All testing will be witnessed by the designer and will be assisted by the University's alarm maintenance technicians.

F. Contractor shall supply 2 technicians with appropriate means of communications for all phases of testing.

3.3 Training

A. Before the system is turned over to the owner, the manufacturer shall provide 2 days of system training. One day for operators and one day for system maintenance personnel. All training shall be performed at the project site using the customers equipment for up to 10 of the owners representatives meeting a minimum expected level of computer competence.

B. This training shall be conducted during normal business hours at a date and time of mutual convenience.

C. Training shall be conducted by a trainer who is factory certified in installation, programming, maintenance, and operation of all supplied components.
3.4 SYSTEM GUARANTEE:

A. The selected vendor shall maintain a service branch within 50 miles of the job site. The selected vendor shall maintain a 24 hour per day service department manned at all times, seven (7) days per week, including holidays.

B. All equipment and wiring shall be guaranteed against defects in materials and workmanship for a one year period from the start up and beneficial use of the system. Warranty service for the equipment shall be provided by the system supplier's factory trained representatives.

END OF SECTION