INTRUSION DETECTION

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. The University of Tennessee currently has in place a Millennium Security Products, “Skyline” access and intrusion detection control system as their standard “head-end” and remote interface controller/communicator. All local control panels and associated I/O, multiplex, and card reader interface modules and card readers are manufactured by Mercury Security Corp. All products and work provided under this section will be completely compatible in all aspects of system architecture, software, programming, data protocols, operating voltages, and input/output characteristics.

B. Extent of intrusion and detection and access system work is indicated herein, and by the contract drawings and schedules. All work and provisions under this specification section shall be considered as an expansion of the existing system.

C. Types of detection in this section include motion detection sensors, door position switches, and acoustic glass break detection.

D. Access control system will include proximity, wiegand, and magnetic stripe entrance readers, continuous duty electric door strikes, exit request detectors and push buttons, magnetic door locks, and various interfaces and interlocks to the IDS.

E. At a minimum, each building on the UTK Campus, that is served by a fire alarm system, shall have in place components listed herein so as to communicate alarm, trouble, and supervisory conditions to the central alarm receiving system. These 3 inputs from the building fire alarm system shall be received at the central
receiving system as separate and distinct signals. Minimum equipment package shall be as follows:

- SMP-E, processor: 1 ea.
- SIM-16 input: 1 ea.
- SRI-52 access control module: 1 ea.
- Communications surge arrester: 1 ea.
- AC primary surge arrester: 1 ea.
- 12VDC power supply w/battery: 1 ea.
- Cabinet to house above: 1 ea.

1.3 QUALITY ASSURANCE:

A. Manufacturer: Firms regularly engaged in manufacture of intrusion detection and access systems, 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 intrusion detection and access control systems installation work similar to that required for 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 intrusion and detection system components and accessories.

D. UL Compliance and Labeling: Provide intrusion and detection system components which are UL-listed and labeled.

E. 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 IDS and access control systems and devices for a minimum of 8 hours standby and 10 minutes of alarm. 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.

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 bases.

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, 2 complete sets of all shop drawings, submittal books, and As-built documents drawings will be delivered directly to the Facility Services, Electrical Maintenance 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 device will be wired, annunciated, and programmed as a separate and distinct input zone.
C. All communication or I/O wiring of any type leaving or entering the building will be protected with surge arresters specified herein.
D. All AC inputs to power supplies and system components will be equipped with surge arresters specified herein.
E. All cabinets shall be keyed alike. The University standard lock set is the C420A
F. All accessible fasteners shall be tamper-proof “snake bite” type.
G. All new doors and frames shall be factory prepped for electric strikes, mortise locks, door and bolt position switches, and magnetic locks. The Security Contractor shall carefully coordinate all aspects of this work with the door supplier to assure complete compatibility and alignment.
H. 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. Cabinet shall be Hoffman Data Com D Box or approved equal. Free standing cabinets shall be Hoffman Proline Server cabinet or approved equal.

PART 2 - PRODUCTS

2.1 LOCAL CONTROL PANEL COMPONENTS.

A. Local processor/control panel shall be a Mercury Security Corp. Model SCP-E. Provide quantities as shown on the drawings, at a minimum, provision shall be capable to handle all devices, functions, and I/O zones as shown.

B. Local multiplexer shall be Mercury Security Corp. SCM-8. The multiplexer shall connect to the SCP-8 mother board to provide 8, RS485 communication channels for connection of card reader hardware and I/O equipment.

C. Local card reader control board shall be Mercury Security Corp. SRI-52 dual reader module. Module shall be capable of connecting 2 wiegand/magnetic stripe, proximity, and keypad reader heads, and shall have 8 programmable inputs and 6 programmable outputs.

D. Local I/O board shall be Mercury Security Corp. SIM-16IN. Module shall be capable of 16 programmable inputs with input parameters of various EOL values, sensitivity ranges, and timing functions. Module shall also have 2 programmable relay outputs.

E. Local output module shall be Mercury Security Corp. SOM-16OUT. Module shall have 16 programmable, form C, relay contacts.

2.2 Peripheral Devices

A. Card reader shall be Mercury Security Corp. SRI-10/20 as shown on the drawings.

B. LCD display, keypad shall be Mercury Security Corp. MR-DT as shown on the drawings.

C. Wall mounted motion detectors shall feature dual detection using microwave and passive infrared technologies. Each detector shall be adjusted and aimed to the individual mounting location to ensure immunity to false alarm from air currents, rotating machinery, etc. Motion detector shall be a Detection Systems DS860 or approved equal. Provide all associated mounting hardware.

D. Ceiling mounted motion detector shall have equal characteristics as the wall mounted unit, but shall feature 360 degree coverage. Ceiling mounted motion detector shall be a Detection Systems DS9360 or approved equal.

E. Request to exit motion detector shall be a Detection Systems DS150 or approved
equal and shall be mounted as per details shown on the plans and specifications.

F. Magnetic door locks shall feature dual voltage operation, and an integral door position switch. Magnetic lock shall be Locknetics 390+ or 320+ depending on frame style and as shown on the drawings. Magnetic locks shall be mounted as shown in the specification details.

G. Over-head door contacts shall feature a 2’ stainless steel armored cable, cast aluminum body and shall have SPDT contacts. Door contact shall be a Sentrol 2327A or approved equal.

H. Door contacts shall be selected as to door type and construction. Door contacts shall be Sentrol 1078CTW, 1070W, 1047T, or 1037W or approved equal.

I. Cabinet tamper switches shall be mounted on all cabinets and shall indicate door movement of 3/4” or more. Tamper switch shall be GRI, TSC40 or approved equal.

J. Frame mounted electric solenoid locks shall be rated for continuous duty as required, and shall come with integral door position switches. Electric strike shall be Von Duprin 6112 or approved equal.

K. Environmental monitoring systems shall be Winland, Enviro Alert, EA-200/400 or approved equal. Monitor shall be supplied with required probes for humidity, hi/lo temperature, water, etc.

L. Money clip switches shall be mounted in all cash boxes. Coordinate locations and wiring entrances with building owner. Switch shall be Ademco 264 or approved equal.

M. Panic switches and associated wiring shall be mounted as concealed as possible under counter space and desks. Careful consideration in location shall be used to ensure ease of switch operation and avoidance of false activation. Panic switch shall be Sentrol 3045 or approved equal.

N. Acoustic glass break detectors shall be ceiling mounted so as to cover as much glass space as possible. Detectors shall have adjustment capabilities so that they can be tuned to each area of coverage. Contractor shall test and adjust each detector with a manufacturers approved and calibrated electronic tester. Acoustic glass break detector shall be Sentrol ShatterPro III. Tester shall be Sentrol 5709C or approved equal.

O. Wireless panic and status receivers shall be Dx format, single channel, programmable units with 32 channels and form C output contacts. Wireless receiver shall be Linear DXR 701 equipped with pendant transmitters DXT61A (qty. as specified) or approved equal.

P. Power supply/battery chargers shall be provided as indicated on the drawings and as per Contractors load and standby calculations. Units will be sized with a minimum of 40% extra output capacity above load calculations. Each power circuit serving control equipment or field devices will be individually fused. “Pig-tail” type fuse holders are not acceptable. Power supplies shall be Altronix SMP10PM24 or SMP5 as required. Fuse holders shall be Altronix ACM8 or
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Voltage driven sirens shall be enclosed in a tamper proof, steel cabinet with hinged cover and integral tamper switch. Siren package shall be Revere Industries RV-R2200SSPD or approved equal.

R.
Surge Arrester shall be Edco FAS-TEL for telephone and communication circuits, FAS-120 for primary AC protection, and TER-018/030 for input circuits or approved equal.

2.3 SYSTEM OPERATION:

A. Provide a complete intrusion detection and access control system to be installed, connected, tested and left in first-class operating condition. These intrusion detection and access control systems shall be designed and submitted with shop drawing and supporting data to document system proposed. Full and seamless integration of the systems shall be included under this contract and accomplished by use of outputs and data interconnections of each control system.

B. The security alarm system shall monitor the integrity of all alarm initiating circuits, and shall be provided with automatically charged batteries to maintain system operation for 8 hours in the normal supervisory mode plus have sufficient capacity to operate in the alarm mode for 10 minutes at the conclusion of this supervisory time period. Batteries shall be supervised for connection to the system and a low voltage threshold. The automatic battery charger shall be capable of charging fully the discharged system batteries to 100% in 12 hours.

C. Location of the control panel, alarm initiating devices, and audio/visual devices shall be as shown on the plans.

2.4 INTRUSION DETECTION SYSTEM:

A. The system shall be comprised of the number of partitions shown on the drawings. Each alarm initiating device shall be wired and programmed as a separate and distinct zone.

B. The system shall be armed, disarmed, reset, monitored and altered by the use of local card readers keypads or remotely by the UTK central alarm receiving system operator. Keypads and readers shall be supplied as indicated on the drawings.

C. Actuation of any zone shall cause the following to occur.
   1. Activate the built in digital communicator for use on the campus proprietary network, or seize the protected premises telephone line and
automatically report the alarm to the central receiving system.

2. Activate any programmed output functions such as sirens, and lock or unlock electrically held doors.

3. Indicate the alarm condition at the local keypad or annunciator.

PART 3 - EXECUTION

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 connection to the central alarm receiving system.

B. Contractor shall be responsible for provision and installation of all system components, conduit and wiring. Contractor shall mount, connect, power and test all devices and alarm zone wiring but shall make no connections to the head end and control equipment. All final terminations and system programming shall be by the University staff technicians. Contractor shall provide technicians familiar with all aspects of the installation and as-built drawings during all phases of the final connections and system certification.

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, and the standards of the University of Tennessee.

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

3.2 TESTING:

A. Immediately after approval of shop drawings and submittals the contractor shall submit for approval, test plans for all equipment, remote reporting, outputs and functions. Plan shall include cause/effect matrix for each type of device, manufacturers recommended testing method for each type of device, and test forms showing every device, order of tests, pass/fail results and notations for the device.
B. Contractor shall supply 2 technicians with appropriate means of communications for all phases of testing.

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

3.3 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 representative during normal working hours, Monday through Friday, excluding holidays. Emergency service provided at times other than as stipulated above shall be available from the same source at additional cost to the owner.
TYPICAL DOUBLE DOOR

DOOR SECURITY HARDWARE DETAIL

NOTES:
ALL ELECTRICALLY HELD EGRESS DOORS MUST RELEASE WITH PANIC HARDWARE OR OUTPUT FROM FIRE ALARM SYSTEM.

ALL NEW DOORS AND FRAMES SHALL BE FACTORY PREPARED FOR ALL SECURITY LOCKS, STRIKES AND HARDWARE.
TYPICAL SINGLE DOOR

DOOR SECURITY HARDWARE DETAIL