

**SECTION 28 16 11****INTRUSION DETECTION SYSTEM****PART 1 - GENERAL****1.1 DESCRIPTION**

- A. Provide and install a complete fully functional Intrusion Detection System, hereinafter referred to as IDS, as specified in this section.

**1.2 RELATED WORK**

- A. For door installation, Section 08 14 33, STILE AND RAIL WOOD DOORS.
- B. For window installation, Section 08 52 00, WOOD WINDOWS.
- C. For window repairs, Section 08 51 03.10, HISTORIC TREATMENT OF WOOD WINDOWS.
- D. For electrical installation, Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- E. For power cables, Section 26 05 21, LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW).
- F. For grounding of equipment, Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- G. For infrastructure, Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.
- H. For underground installation of wiring, Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION.
- I. For Warranty Construction, see GENERAL CONDITIONS.
- J. For General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

**1.3 QUALITY ASSURANCE**

- A. The Contractor shall be responsible for providing, installing, and the operation of the IDS as shown. The Contractor shall also provide certification as required.
- B. The security system shall be installed and tested to ensure all components are fully compatible as a system and can be integrated with all associated security subsystems, whether the security system is stand-alone or a part of a complete Information Technology (IT) computer network.

- C. The Contractor or security sub-contractor shall be a licensed security Contractor as required within the state or jurisdiction of where the installation work is being conducted.

## 1.4 SUBMITTALS

- A. Submit below items in conjunction with Master Specification Sections 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, and Section 02 41 00, DEMOLITION.
- B. Provide certificates of compliance with Section 1.3, Quality Assurance
- C. Provide manufacturer security system product cut-sheets. Submit for approval at least 30 days prior to commencement of formal testing, a Security System Operational Test Plan. Include procedures for operational testing of each component and security subsystem, to include performance of an integrated system test.
- D. Submit manufacture's certification of Underwriters Laboratories, Inc. (UL) listing as specified. Provide all maintenance and operating manuals per the VA General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

## 1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below (including amendments, addenda, revisions, supplement, and errata) form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American National Standards Institute (ANSI)/Security Industry Association (SIA):
- PIR-01-00            Passive Infrared Motion Detector Standard -  
Features for Enhancing False Alarm Immunity
- CP-01-00            Control Panel Standard-Features for False Alarm  
Reduction
- C. Department of Justice American Disability Act (ADA)
- 28 CFR Part 36-90        ADA Standards for Accessible Design
- D. National Electrical Manufacturers Association (NEMA):
- 250-03        Enclosures for Electrical Equipment (1000 Volts  
Maximum)
- E. National Fire Protection Association (NFPA):
- 70-05        National Electrical Code
- 731-06        Standards for the Installation of Electric Premises  
Security Systems
- F. Underwriters Laboratories, Inc. (UL):
- 464-03        Audible Signal Appliances
- 609-96        Local Burglar Alarm Units and Systems

- 634-00 Standards for Connectors with Burglar-Alarm Systems
- 639-97 Standards for Intrusion Detection Units
- 1037-99 Standard for Anti-theft Alarms and Devices
- 1635-96 Digital Alarm Communicator System Units

G. Uniform Federal Accessibility Standards (UFAS), 1984

1.6 WARRANTY OF CONSTRUCTION

- A. Warrant IDS work subject to the Article "Warranty of Construction" of FAR 52.246-21.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. General

1. All equipment associated within the IDS shall be rated for continuous operation. Environmental conditions (i.e. temperature, humidity, wind, and seismic activity) shall be taken under consideration at each facility and site location prior to installation of the equipment.
2. All equipment shall operate on a 120 volts alternating current (VAC); 50 Hz or 60 Hz AC power system unless documented otherwise in subsequent sections listed within this specification. All equipment shall have a back-up source of power that will provide a minimum of 96 hours of run time in the event of a loss of primary power to the facility.
3. The system shall be designed, installed, and programmed in a manner that will allow for ease of operation, programming, servicing, maintenance, testing, and upgrading of the system.
4. All IDS components located in designated "HAZARDOUS ENVIRONMENT" areas where fire or explosion could occur due to the presence of natural gases or vapors, flammable liquids, combustible residue, or ignitable fibers or debris, shall be rated Class II, Division I, Group F, and installed in accordance with National Fire Protection Association (NFPA) 70 National Electric Code, Chapter 5.
5. All equipment and materials for the system will be compatible to ensure functional operation in accordance with requirements.

2.2 EQUIPMENT ITEMS

A. General:

1. All requirements listed below are the minimum specifications that need to be met in order to comply with the IDS.
2. All IDS sensors shall conform to UL 639, Intrusion Detection Standard.
3. Ensure that IDS is fully integrated with other security subsystems as required to include, but not limited to, the CCTV, PACS, EPPS, and Access Control System and Database Management. The IDS provided shall not limit the expansion and growth capability to a single manufacturer and shall allow modular expansion with minimal equipment modifications.

- B. IDS Components: The IDS shall consist of, but not be limited to, the following components:
1. Control Panel
  2. Interior Detection Devices (Sensors)
  3. Power Supply
  4. Enclosures
- C. C. Control Panel:
1. The Control panel shall be the main point of programming, monitoring, accessing, securing, and troubleshooting the IDS. Refer to American National Standards Institute (ANSI) CP-01 Control Panel Standard-Features for False Alarm Reduction.
  2. The Control Panel shall provide a means of reporting alarms to an Access Control System and Database Management via a computer interface or direct connection to an alarm control monitoring panel.
  3. The Control panel shall utilize a Multifunctional Keypad, Input and Output Modules for expansion of alarm zones, interfacing with additional security subsystems, programming, monitoring and controlling the IDS.
  4. The Control panel shall meet or exceed the following minimum functional requirements for programming outputs, system response, and user interface:
    - a. Programming Outputs:
      - 1) 2 Amps (A) alarm power at 12 VDC
      - 2) 1.4 A auxiliary power at 12 VDC
      - 3) Four alarm output patterns
      - 4) Programmable bell test
      - 5) Programmable bell shut-off timer
    - b. System Response:
      - 1) Selectable point response time
      - 2) Cross point capability
      - 3) Alarm verification
      - 4) Watch mode
      - 5) Scheduled events arm, disarm, bypass and un-bypass points, control relays, and control authority levels
    - c. User Interface:
      - 1) Supervises up to eight command points (e.g. Up to 16 unsupervised keypads can be used)
      - 2) Provides custom keypad text
      - 3) Addresses full function command menu including custom functions
      - 4) Allows user authority by defined area and 16-character name
      - 5) Provides for 14 custom authority control levels allowing user's authority to change, add, delete pass codes, disarm, bypass points, and start system tests.
  5. The Control panel shall meet or exceed the following technical characteristics:

Input Voltage via 110 VAC Step-down Transformer	16 or 18 VAC
Operating Voltage	12 VDC
Output Voltage	12 VDC @ 2 A max
Direct Hardwire Zones	7
Partitions	8
Multifunctional Keypads	16 (2 per partition)
Communications Port	RJ-11

6. A multifunctional keypad shall be utilized as a user interface for arming, disarming, monitoring, troubleshooting, and programming the alarm control panel.

7. Keypads shall have the following features:

- a. Multiple function keypads suitable for remote mounting, no greater than 4000 ft (1333 m), shall be provided from the control panel and have a light emitting diode (LED) readout of alarm and trouble conditions by zone.
- b. An alphanumeric English language display, with keypad programmability, and EE-PROM memory, shall also be provided.
- c. Trouble alarm indicators shall be distinguishable from intrusion alarms.
- d. A minimum of four (4) zones selectable as entry and exit with programmable time delay.
- e. Complete system test activated capability at the keypad.
- f. Capability for opening and closing reports to a remote monitoring location.
- g. Adjustable entry and exit delay times.
- h. Capability for a minimum of two (2) multiple function keypads.
- i. Capability to shunt or bypass selected interior zones while arming perimeter protection and remaining interior zones.
- j. Capability for a minimum of seven assignable pass-codes that are keypad programmable from a suppressed master code.

8. Keypads shall meet or exceed the following technical characteristics:

Connections	4-wire flying lead for data and power
Operating Temperature	0°C to +50°C (+32°F to +122°F)
Display Window	8-point LED
Indicators: Illuminated keys	Armed Status-LED
	Point Status-LED
	Command Mode-LED
	Power-LED
Voltage	Nominal 12 VDC

9. An input module shall be utilized to connect additional detection devices to the control panel. This module will meet or exceed the following technical characteristics:

Operating Voltage	8.5 to 14.5 VDC Nominal
Zone Inputs	Style A (Class B) Supervised
Operating Temperature	32 to 140 degrees F (0 to 40 degrees C)

10. An output module shall be utilized to interface the control panel with other security subsystems. The output module shall meet or exceed the following technical characteristics:

Operating Voltage	8.5 to 14.5 VDC Nominal
Output Relays	"Form C" Dry Relay Contracts
Relay Contact Rating	4A @ 24 VDC
	4A @ 24 VAC
	1A @ 70 VAC
Operating Temperature	32 to 140 degrees F (0 to 40 degrees C)

11. The control panel shall have a communications port that will allow for communications with a computer for programming, monitoring, and troubleshooting purposes. The communications port will be, at a minimum, and RJ-11 or better.

12. The control panel will have a systems success probability of 95% or better, and shall include the following success considerations:

- a. False Alarm: Shall not exceed one (1) false alarm per 30 days per sensor zone.
- b. Nuisance Alarm: Shall not exceed a rate of one (1) alarm per seven (7) days per zone within the first 60 days after installation and acceptance. Sensor adjustments will be made and then shall not exceed one (1) alarm per 30 days.

13. The Control Panel will be able to detect either a line fault or power loss for all supervised data cables.

- a. Line Fault Detection: Communication links of the IDS shall have an active mode for line fault detection. Fault isolation at the systems level shall have the same geographic resolutions as provided for intrusion detection. The line fault alarm shall be clearly distinguishable from other alarms.
- b. Power Loss Detection: Provide the capability to detect when critical components experience temporary or permanent loss of power and annunciate to clearly identify the component experiencing power loss.

D. Interior Detection Devices: (Sensors)

1. The IDS shall consist of interior, exterior, and other detection devices that are capable of:

- a. Locating intrusions at individually protected asset areas or at an individual portal;
- b. Locating intrusions within a specific area of coverage;
- c. Locating failures or tampering of individual sensors or components.

2. Provide and adjust for devices so that coverage is maximized in

the space or area it is installed in. For large rooms where multiple devices are required, ensure device coverage is overlapping.

3. Detection sensitivity shall be set up to ensure maximum coverage of the secure area is obtained while at the same time limiting excessive false alarms due to the environment and impact of small animals. All detection devices shall be anti-masking with exception of video motion detection.

4. Dual sensor technology shall be used when possible. Sensor technology shall not be of the same type that is easily defeated by a single method. This will reduce the amount of false alarms.

5. Interior Environmental Conditions: Systems shall be able to operate in environmentally protected interior areas and shall meet operational performance requirements for the following ambient conditions:

- a. If components are installed in unheated areas they shall be able to operate in temperatures as low as 0 F (-17 C);
- b. Interior Sensor Environmental Characteristics:

Temperatures	32F to 120 F (0 to 50 C)
Pressure	<b>Sea Level to 15,000 ft. (4573m) above sea level</b>
<b>Humidity</b>	<b>5% - 95%</b>
<b>Fungus</b>	<b>Components of non-fungus nutrient materials</b>
Acoustical Noise	Suitable for high noise environments above 100db

6. Balanced Magnetic Switches (BMS)

- a. BMS switches shall be surface or recessed mounted according to manufacturer's instructions. Recessed mounted is the preferred method to reduce tampering or defeating of the system. Switches shall activate when a disturbance in the balanced magnetic field occurs.
- b. Switches shall have a minimum of two (2) encapsulated reed switches.
- c. Contractor shall provide each BMS with a current protective device, rated to limit current to 80% of the switch capacity.
- d. Surface Mounted BMS: For exterior application, components shall be housed in weatherproof enclosures.
- e. BMS field adjustments in the fixed space between magnet and switch housing shall not be possible. Attempts to adjust or disturb the magnetic field shall cause a tamper alarm.
- f. BMS Technical Characteristics:

Maximum current	.25 amperes
Maximum voltage	30 VDC
Maximum power	3.0 W (without internal terminating resistors). 1.0 W (with internal terminating resistors).
Components	Three (3) pre-adjusted reed switches Three (3) pre-adjusted magnets

Output contacts	Transfer type SPDT
Contact rating	0.5 amperes, 28 VDC
Switch mechanism	Internally adjustable ¼ - ½ in. (6-13 mm)
Wiring	Two (2) wires #22 American Wire Gauge (AWG), three (3) or 11 foot attached cable
Activation lifetime	1,000,000 activations
Enclosure	Nonferrous materials
Tamper alarm activation	Cover opened 1/8 in. (3 mm) and inaccessible until actuated

7. Window Intrusion Detection: These IDS devices shall detect intrusions thru inertia (shock) or by sound, and shall utilize either a Breakwire Sensor or Acoustic and Seismic Sensor.

a. Breakwire Sensors (wire trap):

- 1) Detect intrusion thru shock or breakage of window glazing. Also used for the protection of utility openings.
- 2) Sensors shall consist of fine wire embedded in or affixed to interior of glazing. Breakage of protected glazing shall result in wire breakage.
- 3) Wire shall be hard-drawn copper up to #22 AWG diameter.
- 4) If sensors are affixed to glazing the sensor shall be protected by a clear coating which shall not affect sensor functioning.
- 5) Sensor shall be terminated in insulated connectors which are concealed and tamper resistant.
- 6) Protection of inlet openings:
  - a) Shall consist of up to 22 AWG hard-drawn copper wire with a tensile strength of 17.8 N 4 pounds maximum.
  - b) Wire shall be interlaced throughout the opening such that no opening between wires shall be larger than 4 in. (100 mm) on center.
  - c) Sensors shall be terminated so that attempts to cut the wire or otherwise enlarge openings between wires shall cause an alarm.
  - d) Sensors shall be terminated in insulated connectors which are concealed and tamper resistant.

b. Acoustic and Seismic Glass Break Detectors:

- 1) Detects intrusion thru the use of audible sound and vibration emitted from the breaking of glass using a tuned frequency range and sound pattern recognition. This initiates an alarm when glass they protect is broken or cracked.
- 2) Detectors shall be installed in strict conformance with manufacture's installation instructions.
- 3) The detector's power circuit shall be switched via an



- output relay on the control panel to provide latching alarm LED reset capability.
- 4) Sensors shall be contained in a fire-resistant ABS plastic housing and must be mounted in contact with a window.
  - 5) Sensing shall be accomplished through the use of a mechanical filtered piezoelectric element.
  - 6) Sensors shall have a sensitivity adjustment controlling output voltage from the piezoelectric element which triggers a solid-state latching device.
  - 7) Sensors shall selectively filter input to minimize false alarms and not initiate alarm in response to ambient seismic vibrations or other ambient stimuli.
  - 8) A manufacture's test unit will be used to validate the sensor by simulating glass breakage.
  - 9) The Contractor shall provide sensors for adjusting sensitivity and two-sided polyurethane tape with acrylic adhesive for window attachment.
  - 10) Sensor shall include exterior label to protect adhesive tape from direct sunlight.
  - 11) Window Intrusion Detection Sensor Technical Specifications:

Power	Auxiliary power supply 12 VDC @ 25 mA (+/-) 10%
Power Input	10 - 15 VDC at 16mA protected against reverse polarity, 20 mA during relay closure
Relay Output Rating	Minimum of 25 VDC mA
Coverage Audio	6,000 Square ft.
Coverage Glass Break	25 ft. (7.5 m) wide by 25 ft. wide (7.5 m)  Minimum: 25 feet (7.62 m) from the detector to the furthest point on protected glass.
Audio Output	300 - 12,000 HZ
Alarm Output	Relay NO or NC selectable
Interconnection	12 pin Panduit connector, 22 AWG
Radio Frequency Interface	No alarm or setup on between frequencies 26 - 100 MHz 50 v/m  Immunity to mobile RF interference 100 watts @ 9.8 Ft. (3 m) in 27-100 MHz range
Alarm period	Two (2) to three (3)
Mounting	Ceiling, same wall, adjacent wall, opposite wall
Features	Test and alarm LEDs for acoustic seismic and alarm condition latching, Alarm LED and tamper switch on cover.
Alarm verification	Digital signal processing or dual acoustic processing technologies
Detection ability	Single and multi-pane glass, wired

	glass, tempered and laminated glass to ¼ inch (6 mm) or thickness
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8. Passive Infrared Motion Sensors (PIR): These sensors shall detect an intruder presence by monitoring the level of infrared energy emitted by objects within a protected zone and meet ANSI PIR-01 Passive Infrared Motion Detector Standards Features for Enhancing False Alarm Immunity. An alarm shall be initiated when motion and temperature changes within set patterns are detected as follows.

- a. The detector shall provide multiple detection zones distributed at a variety of angles and distance.
- b. Sensors shall be passive in nature; no transmitted energy shall be required for detection.
- c. Sensors shall be sensitive to infrared energy emitted at wavelengths corresponding to human body and other objects at ambient temperatures.
- d. Sensors shall not alarm in response to general area thermal variations and shall be immune to radio frequency interference.
- e. Sensors shall not be susceptible to changes in temperature due to an air conditioner being turned on or off.
- f. Sensors shall be housed in a tamper-alarmed enclosure.
- g. Sensor detectors shall include motion analyzer processing, adjustable lens, and walk test LED's visible from any angle.
- h. Sensors shall provide some means of indicating an alarm condition during installation and calibration. A means of disabling the indication shall be provided within the sensor enclosure.
- i. Sensor detectors shall include a motion monitoring verification circuit that will signal trouble or alarm if the detector fails to detect motion for an extended period.
- j. PIR Technical Characteristics:

Power	Six (6) - 12 VDC 25 mA continuous current draw 38 mA peaks
Alarm Velocity	Five (5) ft. (1500 mm) at a velocity of 0.1 ft. (30 mm) per second, and one (1) step per second, assuming 6 in. (150 mm) per step. Also, faster than 0.1 foot (30 mm) per second, up to 10 feet (3000 mm) per second
Maximum detection range	35 ft. (10.6 m)
Frequency range- non activation or setup use	26 to 950 MHz using a 50 watt transmitter located 1 ft. from the unit or attached wiring
Infrared detection	3°F (1 1/2°C) different from the background temperature
Detection Pattern	180 degrees for volumetric units, non PIR 360

PIR 360°Detection Pattern	Programmable 60 detection zones including one directly below
Mounting	Ceiling and walls
Ceiling heights	Eight (8) ft. (2.4 m) - 18 ft (5.4 m)
Sensitivity adjustments	Three (3) levels

9. Tamper Alarm Switches: The following IDS sensors shall be used to monitor and detect potential tampering of sensors, control panels and enclosures.

- a. Tamper Switches: All enclosures including cabinets, housings, boxes, raceways, and fittings with hinged doors or removable covers containing circuits and power supplies related to the IDS shall include corrosion-resistant tamper switches.
- b. Tamper alarms shall be annunciated to be clearly distinguishable from IDS alarms.
- c. Tamper switches will not be in a viewable from a direct line of sight perspective. The minimum amount of time the tamper switch becomes active and sends a signal after an enclosure is opened or panel removable is attempted, shall be one (1) second.
- d. Tamper switches will initiate when enclosure doors or covers is removed as little as 1/4 in. (6.35 mm) from the closed position unless otherwise indicated. Tamper switches shall be:
  - 1) Push/pull automatic reset type;
  - 2) Inaccessible until switch is activated;
  - 3) Spring-loaded and held in closed position by door or cover; and
  - 4) Wired to break a circuit when door or cover is removed with each sensor annunciated individually at a central reporting processor.
- e. Fail-Safe Mode: Shall provide the capability to detect and annunciate diminished functional capabilities and perform self-tests. Fail-safe alarms shall be annunciated to be clearly distinguishable from other types of alarms.

E. Power Supply

1. A power supply shall only be utilized if the control panel is unable to support the load requirements of the IDS system.
2. All power supplies shall be UL rated and able to adequately power two entry control devices on a continuous base without failure.
3. Power supplies shall meet the following minimum technical characteristics:

INPUT POWER	110 VAC 60 HZ 2 amp
OUTPUT VOLTAGE	12 VDC Nominal (13.8 VDC) 24 VDC Nominal (27.6 VDC) Filtered and Regulated

BATTERY	Dependant on Output Voltage shall provide up to 14 Ah, rechargeable
OUTPUT CURRENT	4 amp max. @ 13.8 VDC 3 amp max. @ 27.6 VDC
BATTERY FUSE SIZE	3.5 A @ 250 VAC
CHARGING CIRCUIT	Built-in standard

F. Enclosures:

1. All control panels, input and output modules, and power supplies shall be housed inside a metal enclosure in accordance with National Electrical Manufacturers Association (NEMA) 250 Enclosures for Electrical Equipment.
2. The enclosure shall be UL rated, lockable and alarmed with a tamper alarm switch that is monitored by the control panel.
3. The enclosures will be NEMA 4 rated if exterior mounted.
4. All connections to the enclosure shall meet or exceed the requirements set forth in the NEC.

2.3 INSTALLATION KIT

A. General

1. The kit shall be provided that, at a minimum, includes all connectors and terminals, labeling systems, audio spade lugs, barrier strips, punch blocks or wire wrap terminals, heat shrink tubing, cable ties, solder, hangers, clamps, bolts, conduit, cable duct, and/or cable tray, etc., required to accomplish a neat and secure installation. All wires shall terminate in a spade lug and barrier strip, wire wrap terminal or punch block. Unfinished or unlabeled wire connections shall not be allowed. All unused and partially opened installation kit boxes, coaxial, fiber-optic, and twisted pair cable reels, conduit, cable tray, and/or cable duct bundles, wire rolls, physical installation hardware shall be turned over to the Contracting Officer. The following sections outline the minimum required installation sub-kits to be used:

2. System Grounding

- a. The grounding kit shall include all cable and installation hardware required. All head end equipment and power supplies shall be connected to earth ground via internal building wiring, according to the NEC.
- b. This includes, but is not limited to:
  - 1) Coaxial Cable Shields
  - 2) Control Cable Shields
  - 3) Data Cable Shields
  - 4) Equipment Racks
  - 5) Equipment Cabinets
  - 6) Conduits
  - 7) Cable Duct blocks
  - 8) Cable Trays
  - 9) Power Panels

- 10) Grounding
- 11) Connector Panels

3. Wire and Cable: The wire and cable kit shall include all connectors and terminals, audio spade lugs, barrier straps, punch blocks, wire wrap strips, heat shrink tubing, tie wraps, solder, hangers, clamps, labels etc., required to accomplish a neat and orderly installation.
4. Conduit, Cable Duct, and Cable Tray: The kit shall include all conduit, duct, trays, junction boxes, back boxes, cover plates, feed through nipples, hangers, clamps, other hardware required to accomplish a neat and secure conduit, cable duct, and/or cable tray installation in accordance with the NEC and this document. Provide color coding of all conduit and raceways with a 1-inch blue band every 10-feet. All junction boxes shall have the cover painted blue.
5. Equipment Interface: The equipment kit shall include any item or quantity of equipment, cable, mounting hardware and materials needed to interface the systems with the identified sub-system(s) according to the OEM requirements and this document.
6. Labels: The labeling kit shall include any item or quantity of labels, tools, stencils, and materials needed to label each subsystem according to the OEM requirements, as-installed drawings, and this document.
7. Documentation: The documentation kit shall include any item or quantity of items, computer discs, as installed drawings, equipment, maintenance, and operation manuals, and OEM materials needed to correctly provide the system documentation as required by this document and explained herein.\_

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. IDS installation shall be in accordance with Underwriters Laboratories (UL) 639 Standards for Intrusion Detection Units and UL 634 Standards for Connectors with Burglar Alarm Systems, and appropriate manufacture's installation manuals for each type of IDS.
- B. Components shall be configured with appropriate "service points" to pinpoint system trouble in less than 30 minutes.
- C. The Contractor shall install all system components including VA furnished equipment, and appurtenances in accordance with the manufacturer's instructions and shall furnish all necessary connectors, terminators, interconnections, services, and adjustments required for a complete and operable system.
- D. The IDS will be designed, engineered, installed, and tested to ensure all components are fully compatible as a system and can be integrated with all associated security subsystems, whether the system is a stand alone or designed as a computer network.
- E. The IDS shall be able to be integrated with other security subsystems. Integration with these security subsystems shall be achieved by

computer programming and the direct hardwiring of the systems. Determination for methodology shall be outlined when the system(s) is/are being designed and engineered. For installation purposes, the IDS shall utilize an output module for integration with other security subsystems. The Contractor will ensure all connections are per the OEM and that any and all software upgrades required to integrate the systems are installed prior to system start-up.

- F. For programming purposes, the Contractor shall refer to the manufacturer's requirements and Contracting Officer instructions for correct system operations. This includes ensuring computers being utilized for system integration meet or exceeds the minimum system requirements outlined in the IDS software packages.
- G. Lightening and power surges to the central alarm reporting and display unit shall be protected at both ends against excessive voltages. This requirement shall apply for circuits that are routed both in underground conduits and overhead runs.
- H. At a minimum, the Contractor shall install primary detection devices, surge arresters, and secondary protectors to reduce dangerous voltages to levels that will cause no damage. Fuses shall not be permitted as protection devices.
- I. The Contractor shall provide fail-safe type surge arresters on exposed IDS data circuits. In addition, transient protection shall protect against spikes up to 1000 volts peak voltage with a one-microsecond rise time and 100-microsecond decay time, without causing false alarms. The protective device shall be automatic and self-restoring. Also, circuits shall be designed or selected assuming a maximum of 25 ohms to ground.

J. Product Delivery, Storage and Handling:

- 1. Delivery: Deliver materials to the job site in OEM's original unopened containers, clearly labeled with the OEM's name, equipment model and serial identification numbers, and UL logo. The Contracting Officer may inventory the IDS equipment at the time of delivery and reject items that do not conform to this requirement.
- 2. Storage and Handling: Store and protect equipment in a manner that will preclude damage as directed by the Contracting Officer.

K. Cleaning and Adjustments:

- 1. Cleaning: Subsequent to installation, clean each system component of dust, dirt, grease, or oil incurred during installation in accordance to manufacture instructions.
- 2. Prepare for system activation by following manufacturer's recommended procedures for adjustment, alignment, or synchronization. Prepare each component in accordance with appropriate provisions of the component's installation, operations, and maintenance instructions.

L. Tamper Switches

- 1. Install tamper switches to initiate an alarm signal when a panel, box, or component housing door or cover is moved as little as 6.35 mm 1/4 inch from the normally closed position unless otherwise specified.

2. Locate tamper switches within enclosures, cabinets, housings, boxes, raceways, and fittings to prevent direct line of sight to any internal components and to prevent tampering with switch or circuitry.

3. Conceal tamper switch mounting hardware so that the location of the switch within the enclosure cannot be determined from the exterior.

M. Unique IDS Installation Components:

1. BMS Surface Mounted:

- a. Surface mounted BMS housing for the switch element shall have the capability to receive threaded conduit. Housing covers for surface mounted BMS, if made of cast aluminum, shall be secured by stainless steel screws. Magnet housing cover shall not be readily removable and BMS housings shall be protected from unauthorized access by a cover operated, corrosion-resistant tamper device.
- b. Conductors running from a door to alarm circuits shall be contained within a flexible armored cord constructed from corrosion-resistant metal. Each end of the armored cord shall terminate in a junction box or other enclosure. Armored cord ends shall be mechanically secured to the junction boxes by clamps or bushings. Conductors within the armored cord shall be provided with lug terminals at each end. Conductors and the armored cord shall experience no mechanical strain as the door is removed from fully open to closed position. Switch circuits shall initiate an alarm if a short circuit is applied to the door cord.
- c. For exterior application on double gates, both BMS elements must be mounted on the gate. Flexible armored cord constructed from corrosion-resistant metal shall be used to provide electrical connection.

2. BMS Recessed Mounted:

- a. Ball bearing door trips shall be mounted within vault door headers such that when the locking mechanism is secured, the door bolt engages an actuator, mechanically closing the switch.
- b. Door bolt locking mechanisms shall be fully engaged before the ball bearing door trip is activated. Also, circuit jumpers from the door shall be provided.

3. Passive Infrared Detectors: (PIR)

- a. The protective beam shall be focused in a straight line.
- b. Installed beam distance from transmitter to receiver shall not exceed 80% of the manufacturer's maximum recommended rating.
- c. Mirrors may be used to extend the beam or to establish a network of beams. Each mirror used shall not lower the rated maximum system range by more than 50%.
- d. Mirrors and photoelectric sources used in outdoor applications shall have self-heating capability to eliminate condensation and shall be housed in weatherproof enclosures.

3.2 TESTS AND TRAINING

- A. All testing and training shall be compliant with the VA General Requirements, Section 01 00 00, GENERAL REQUIREMENTS.

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