

SECTION 16725

INTRUSION DETECTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions (if any), along with the General Requirements, apply to the work specified in this Section.

1.2 DESCRIPTION

- A. Work covered under this section consists of furnishing and installing a complete commercial UL listed, electronically supervised, battery backed-up, intrusion detection and control system as indicated on the drawings and specified herein. System shall include a central control panel, power supplies, remote modules, control keypads, motion detectors, magnetic contacts, and interconnecting wiring. Installation Company shall assume all responsibility for existing security system functionality and will maintain said equipment as operational or protect the premises by other means such as providing a security service to monitor the site and property.

1.3 QUALITY ASSURANCE

- A. Reference Standards: Materials and workmanship shall conform to the Standards of the National Electrical Code, 2002 Edition, the latest edition of the Florida Building Code, Americans with Disabilities Act (Public Law 101-336), and any applicable state and local codes. All equipment shall be U.L. listed.

1.4 SUBSTITUTIONS

- A. Requirements: To maintain compatibility with existing DCPS central monitoring equipment, no substitutions will be accepted.

1.5 GUARANTEE

- A. Requirements: See Section 16050 "Electrical Basic Materials and Methods."

1.6 APPROVED MANUFACTURERS

- A. All equipment shall be new, UL listed and of current production of a national firm regularly engaged in such manufacturing. Where products or materials are listed herein by manufacturer and model number, this information is provided to further establish the quality

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level and specific characteristics of the required product. Essentially, all products specified herein are manufactured by "ADEMCO Group."

1.7 SUBMITTALS

- A. Prior to purchasing equipment, the Contractor shall submit information on the system and all associated equipment sufficient to assure full compliance with the contract requirements for approval. The submittal information shall include manufacturer's catalog information, drawings, diagrams, and any other information necessary to establish contract compliance. Submit the following:
 - 1. Control panel
 - 2. Magnetic door contacts, each type
 - 3. Control keypads
 - 4. Motion sensors, each type
 - 5. Remote point modules
 - 6. Loop isolation modules
 - 7. Cables
 - 8. Transient protection devices
- B. Data, which describe more than one type of item, shall be clearly marked to indicate which type the Contractor intends to provide. Submit one original for each item and clear, legible, first-generation photocopies for the remainder of the specified copies. Incomplete or illegible photocopies will not be accepted. Partial submittals will not be accepted.
- C. Shop Drawings: Provide drawings that clearly and completely indicate the function of the control panel and devices connected thereto. Complete sequence of operation of all functions. Indicate termination points of devices and indicate the interconnection of modules required for proper operation of the system. Indicate interconnection between modules and devices connected thereto. Drawings shall indicate all wiring labels, physical location of all devices, (including end of line devices) and all externally operated equipment. Show wire color coding, and wire counts. Provide a zone location map comprised of plan views showing the mounting location and address for each alarm-initiating device. Drawings shall be the same size as the full size contract documents. In addition to paper copies, submit one set of electronic drawings on CD in AutoCAD Release 2006 format.
- D. Qualifications of Installer: Submit data showing that the Contractor has successfully installed intrusion detection systems of the same type and design as specified herein. The data shall include the

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names and locations of at least two installations where the Contractor, has installed such systems. The Contractor shall indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 18 months. The intrusion detection system contractor shall have a factory trained service department on call 24 hours per day, 365 days per year that is located within a 75 mile radius of the project location.

- E. Operation and Maintenance Manuals: Provide two copies of an abbreviated operation and maintenance manual with spare parts lists neatly bound and indexed in a three-ring binder. Manual shall include basic data regarding maintenance, operation and troubleshooting of all provided equipment.
- F. Calculations: Provide resistance and/or cable length calculations to substantiate that all installed cables will be within the parameters recommended by the equipment manufacturer.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND COMPONENTS

- A. Equipment and components shall conform to applicable requirements of NFPA 70. Units of the same type of the equipment shall be the product of single manufacturer. All preexisting security system equipment not used in the installation shall be removed by the Security Contractor and returned to the DCPS Security Department.

2.2 CONTROL PANEL

- A. Provide an alarm control/communicator panel mounted in a surface metal enclosure with hinged lockable door. No more than four wires may be terminated per terminal. The control panel cabinet shall be a factory assembly incorporating DC power supplies, batteries, battery charger, circuit boards, and relays. The Control Panel shall be an 8-partition unit, capable of supporting hardwire, hardwire expansion, and wireless zones. Peripheral devices supported by the Control Panel shall include dialers (telephone lines), keypads, RF receivers, and relays. Provide an ADEMCO Vista -128FB/250FBP control panel meeting the following performance requirements:
 - 1. Basic Hardwire Zones - A total of 8 style-B hardwire zones shall be capable of supporting the following:
 - a) EOLR supervision supporting normally open (N.O.) or normally closed (N.C.) sensors.
 - b) Individually assignable to one of 8 partitions.
 - c) Individually assignable to bell outputs and/or auxiliary relay.

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- d) For this application, use two of these zones for monitoring the fire alarm control panel for common trouble and common alarm.
2. Polling Loop Expansion Zones - The Control Panel shall also be capable of supporting up to 120 additional hardwire zones using a built-in, 2-wire, polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA. The polling loop zones shall be capable of:
- a) Using Remote Point Module (RPM) devices.
 - b) Supervision by the Control Panel.
 - c) Individually assignable to one of the partitions.
 - d) Individually assignable to bell outputs and/or auxiliary relay.
 - e) 4,000-foot capability without shielded cable.
3. Wireless Expansion Zones - The Control Panel shall also be capable of supporting up to 128 wireless zones via a radio frequency (RF) receiver. The system wireless capabilities may be used in the future, but will not be utilized for this application. The Wireless zones shall be capable of:
- a) Supervision by the Control Panel for check-in signals.
 - b) Individually assignable to one of the partitions.
 - c) Individually assignable to bell outputs and/or auxiliary relay.
 - d) Tamper protection shall be optional.
4. Partitions – The independent partitions shall provide the following features:
- a) Master Partition shall be provided for assigning keypads capable of simultaneously viewing the system status of all 8 partitions.
 - b) All 8 partitions shall be capable of having keypads assigned.
 - c) All zones, except fire, shall be assignable to one of 8 partitions.
 - d) All 8 partitions shall be capable of supporting relays.
 - e) The ability to display fire and/or burglary and panic and/or trouble conditions at all other partition keypads shall be optional.

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- f) The ability to support selectable options including entry/exit delay and subscriber account information.
5. User Codes - The Control Panel shall accommodate 150 user codes with 7 authority levels. The following characteristics shall be assigned to each user code.
- a) Authority level.
 - b) Partitions operated by the user code.
 - c) Global arming capability.
 - d) Use of RF button to arm and disarm the system.
 - e) Optional opening/closing central station reporting.
6. Peripheral Devices - The Control Panel shall support up to 31 addressable devices. The devices shall include any combination of keypads, RF receivers, relay modules, and VIP modules. Peripheral devices shall have the following characteristics: Each device shall be:
- a) Physically set to an individual address.
 - b) Enabled using the Device Programming Mode.
 - c) Remote Keypads: The Control Panel shall be compatible with remote keypads and allow the user to:
 - d) Arm and disarm the system or one partition in a multiple partition system.
 - e) Bypass zones.
 - f) View messages from the central station.
 - g) Display zone descriptors (alarm, trouble, bypass, etc) in the display window.
7. Ancillary Control - The Control Panel shall be capable of being programmed to activate up to 32 control relays, which open doors, turn off lights, etc.
8. Telephone Dialers - The Control Panel shall be equipped with a built-in supervised telephone dialer for communications with the central station. It shall also be capable of supporting a supervised back-up dialer for connecting to a second telephone line.
9. Trigger Output Connector - The Control Panel shall contain an internal connector equipped for a single input and seven outputs. The outputs shall interface with:
- a) Remote keypad sounder.
 - b) UL listed key switch.

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- c) LED indicator module.
 - d) Auxiliary alarm signaling equipment.
 - e) Event logging serial printer.
 - f) Computer used to direct mire downloading via a serial module.
10. Key switch - All partitions within the Control Panel shall be capable of supporting a key switch.
11. Pager Interface - The Control Panel shall be capable of sending event information to an alphanumeric pager via a pager interface device.
12. Voltage Triggers - The Control Panel shall provide a trigger outputs. The trigger connector pins change state for different conditions in order to interface with equipment such as long range radio equipment (LRR), remote keypad sounders, key switch ARMED and READY LEDs, or a system event log printer.
13. Event Log - The Control Panel shall contain a programmable event log capable of the following:
- a) Storing up to 224 events.
 - b) Viewable at the keypad.
 - c) Printed on a serial printer.
 - d) Storing access control system events.
 - e) Sending printed events to an alphanumeric pager.
14. Scheduling - The Control Panel shall provide the following automated scheduling capabilities:
- a) Open/Close schedules used to control arming/disarming and reporting.
 - b) Holiday schedules, which allow different, time windows for open/close schedules.
 - c) Timed events, which activate relays, auto-bypassing, un-bypassing, auto- arming, and disarming.
 - d) Access schedules, which limit system access to users, by name.
 - e) End User Output Programming Mode shall provide 20 timers for relay control.
15. Communications Formats - The Control Panel Digital Communicator shall support the following formats for the primary and secondary central station receivers:

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- a) ADEMCO Low Speed (Standard or expanded)
 - b) Sescoa/Radionics
 - c) ADEMCO Express
 - d) ADEMCO High Speed
 - e) ADEMCO Contact ID
16. Exit Error False Alarm Prevention - The Control Panel shall be capable of differentiating between an actual alarm and a false one caused by leaving an entry/exit door open. The Control Panel shall be capable of:
- a) Being arming while the faulted entry/exit zone(s) and/or interior zones are bypassed.
 - b) Generating an Exit Error report by user and zone.
17. Downloading Features - The Control Panel shall be capable of uploading and downloading at 300 baud. It shall also be capable of uploading ECP devices, their physical addresses, programmed addresses, and firmware revision levels.
18. Enhanced Fire Walk-Test Mode - The Control Panel shall provide the installer with the following features:
- a) Automatic test of all integrated remote point module (RPM) devices, equipped with an automatic test feature.
 - b) While automatic test is in progress all fire zones that remain untested shall be displayed.
 - c) An event log shall be capable of logging the results of tested and untested zones.
 - d) The ability to report the result of tested and untested zones to the central station.
19. Built-in User's Manual and Descriptor Review - A built-in User's Manual shall be provided for End User convenience. The following shall be provided:
- a) A brief explanation of keypad functions shall be provided at the keypad alphanumeric display.
20. Access Control
- a) In addition, the Control Panel shall be capable of being connected to a Vista-Key V-Plex integrated access control systems.
21. Enclosure - The Control Panel shall be enclosed in a metal cabinet, suitable for wall mounting.

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22. System Power - The Fire and Burglary Alarm System shall operate using standard 120 volts AC, 50/60 Hz power. Obtain primary power from a circuit breaker as indicated. Provide a circuit breaker guard to prevent accidental tripping of the circuit breaker.
- a) Control Primary Power – Open frame transformer providing 18 VAC, 72 VA in enclosure, connected to a dedicated circuit. ADEMCO No. 1451
 - b) Backup Battery - A rechargeable 12 VDC, gel type, lead acid backup battery shall be provided. The battery shall be rated 7-ampere hours (AH).
 - c) Alarm Power - Alarm power shall be 12 VDC, 1.7 amps for each bell output.
 - d) Auxiliary Standby Power - Standby power shall be 12 VDC, 1 amp maximum.
 - e) Total Power - Combined auxiliary standby and alarm currents shall be 2.3 amps.
 - f) Fusing - The battery input, auxiliary, and bell outputs shall be protected using PTC circuit breakers. All outputs shall be power limited.
 - g) Use of control panel power to external devices shall be limited to remote keypads only. All other external devices requiring power shall be connected to the auxiliary power supply as further specified herein.
23. Environmental Conditions - The Alarm System shall be designed to meet the following environmental Conditions
- a) Storage Temperature - The system shall be designed for a storage temperature of 10°C to 70°C.
24. Operating Temperature - The system shall be designed for an operating temperature of 0°C to 50°C (32°F to 120°F).
25. Humidity - The system shall be designed for normal operation in an 85% relative humidity environment.
26. Electromagnetic Interference – The system shall meet or exceed the requirements of FCC Part 15, Class B devices, FCC Part 68, IEC EMC directive.

2.3 CONTROL KEYPADS

- A. Provide ADEMCO Model #6160 control keypads located as indicated. Keypad located beside main security panel shall be

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Model #6160CR. Each control keypad shall comply with the following:

1. Keypads shall be surface mounted and capable of fully programming and operating the system. Each keypad shall be assignable to operate the entire system or an individual partition.
2. LCD keypads shall be complete with large two-line 32-character liquid crystal display (LCD) to provide plain language programming instructions, operating instructions and display of all alarms and supervisory conditions.
3. Keypad keys and displays shall be backlit.
4. Keypads shall have rotating key press buffer to reduce access code entry false alarms. Keypads shall be programmable to lock out if a series of incorrect access code entries are made.
5. Keypads shall have keypad activated emergency alarms for panic, auxiliary, and duress; and shall be equipped with a Piezo Buzzer to provide audible feedback for correct key entries, pre-alert, and trouble.
6. Keypads shall be mounted at a height no lower than sixty inches (60"), and where necessary shall be enclosed in a vandal-proof enclosure keyed to the DCPS Security Department's existing key set.

2.4 REMOTE POINT MODULES

- A. Provide ADEMCO Model 4208SN universal eight zone remote point modules (RPM) as indicated. The characteristics of each remote point module shall be as follows:
 1. Each RPM shall obtain 12-volt DC operating power from the auxiliary power supply Altronix No. SMP5PM-CTX.
 2. RPM's shall be used for monitoring conventional supervised zones and reporting zone status to the main control panel via the control panel data line-reporting loop.
 3. Provide end-of-line resistors in each reporting zone in accordance with the manufacturer's recommendations.

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4. Adjust dipswitch settings for serial number zone identification mode and slow response as directed by the Owner.
5. 4208SN RPM modules are to be installed on $\frac{3}{4}$ " thick plywood (painted light gray with fire retardant paint) in metal cabinets (Hoffman #A30N248LP) accessible for servicing. Zone assignments are to be labeled permanently on 4208SN covers.

2.5 LOOP ISOLATION MODULES

- A. Provide ADEMCO Model 4297 loop isolation modules to isolate open and short circuit faults on the system data line-polling loop.
 1. Each isolation module shall obtain 12 volt DC operating power from the auxiliary power supply.
 2. All isolation modules shall be properly connected and grounded.
 3. The loop isolation module shall serve to isolate the extension-polling loop from the input-polling loop. Do not remove or disconnect the jumper that would inhibit or prevent this function.

2.6 AUXILIARY POWER SUPPLY

- A. An auxiliary power supply shall be used for providing regulated 12 volt DC operating power for all security system devices external to the control panel with the exception of keypad controls.
 1. The combination supervised power supply/charger shall be Altronix No. SMP5PM-CTX.
 2. The power supply will be furnished complete with a 120 volt input transformer, combination power supply/charger printed circuit board, and rechargeable battery housed in a surface mounted metallic enclosure.
 3. The power supply shall have backup battery supervision monitored by the security control panel.
 4. The power supply shall be configured for a 12 volt DC, 4.0 amp continuous power limited output.
 5. Equip power supply with a 12 volt, 7-ampere hour backup battery identical to the battery provided in the control panel.

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6. Obtain primary 120-volt AC operating power for the auxiliary power supply from the same power circuit that serves the control panel. Circuit connection shall be made on the load side of the provided line voltage surge arrester.

2.7 TRANSIENT PROTECTION DEVICES

- A. Provide line voltage and low voltage surge suppression devices to suppress all voltage transients, which might damage the control panel components. Mount suppressors as indicated.
 1. Line Voltage Surge Suppressor: Suppressor shall be UL 1449 listed with a maximum 330-volt clamping level and a maximum response time of 5 nanoseconds. Suppressor shall also meet IEEE C62.41 category B tests for surge capacity. Suppressor shall be a multi-stage construction, which includes inductors and silicon avalanche zener diodes. Suppressor shall have a long-life indicating lamp (light emitting diode or neon lamp), which extinguishes upon failure of protection components. Fuses shall be externally accessible. Wire in series with the incoming power source to the protected equipment using screw terminations. Suppressor shall be EDCO Model FAS-120AC.

2.8 MAGNETIC DOOR CONTACT

- A. Surface Mounted Switches. Surface Mounted Switches may only be used on existing doors where new doorframes are not to be installed. Switches shall activate when a disturbance in the magnetic field occurs. Switches shall be rated for a minimum lifetime of one million operations. Surface mount magnetic door contact shall be George Risk Industries No. 29AWGG.
- B. Flush Mounted Switches: Provide recessed rectangular type biased magnetic contact designed for installation in an ANSI standard doorframe cutout opening. Contact shall be Sentrol No. 1090-G. Locate contact in the top doorframe 2-inches away from the strike side of the door. The doorframe must be factory prepared to accept the door contact. Factory preparation shall include the installation of 1-1/2-inch wide, 1-1/2-inch tall, 5-7/8-inch long mortar box within the frame and providing the appropriate opening in the frame to accept the recessed door contact faceplate.
- C. Door switches are to be identified permanently with their zone assignment number.

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2.9 MOTION SENSORS

- A. Dual technology sensors: Provide sensor combining passive infrared and microwave sensors designed and manufactured specifically to be mounted in a single enclosure. Motion detection sensors are to have all installation holes (including wiring entry and hardware mounting) sealed with clear RTV silicone.
1. Passive infrared (PIR) sensor section: Sensor shall detect intruder presence by monitoring the level of infrared energy emitted by objects within a protected zone. Sensor shall initiate an alarm upon observing increased or fluctuating infrared energy caused by the presence and motion of an intruder whose temperature is as little as 3 degrees F different from the background temperature. Sensor shall be passive in nature; no transmitting energy shall be required for detection. Sensor shall be sensitive to infrared energy emitted at wavelengths corresponding to human body or other objects at ambient temperatures. The PIR fields of view shall be focused on the pyroelectric sensing element by means of a plastic Fresnel lens mounted in the front cover of the housing. The PIR fields of view within the protected area shall consist of 22 long-range fields, 6 intermediate fields, 3 lower fields, and 6 lookdown fields. The lookdown fields shall be implemented by means of a mirror mounted adjacent to the pyroelectric sensing device and an infrared-transparent window mounted in the bottom surface of the sensor.
 2. Microwave sensor section: Sensor shall detect intruder presence by transmitting electromagnetic energy into a protected zone, receiving the direct and reflected energy, and monitoring the frequency shift between transmitted and received signals. If more than one device is used in an area, devices shall operate on different frequencies. Provide for selective filtering by sensor to minimize nuisance alarms due to moving metal objects such as fan blades and Venetian blinds, interference from radar, or other sources of electronic interference. Transceivers shall consist of a combined transmit/receive antenna and an adjustable-gain preamplifier in a single housing. Provide transceivers with sensitivity adjustments. Transceiver controls shall permit adjustment of transmission range and alarm signal threshold. Sensitivity controls shall be inaccessible to operating personnel. Sensitivity requirements shall be met with sensitivity controls set approximately at midrange. The sensor shall incorporate

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a microwave supervision system, which shall activate the alarm output if the microwave technology fails.

3. Additional dual technology sensor requirements: Both the microwave and PIR sections shall activate simultaneously to generate an alarm. Only an intrusion characterized by volumetric motion and radiant body heat shall be detected. Sensor shall provide a means of indicating an alarm condition during installation and calibration. A means of disabling the indication shall be provided within the sensor enclosure. Sensor shall alarm when an intruder moves within the area of protection more than 5 feet at a velocity of 0.1 foot per second, and one step per second, assuming 6 inches per step. Detection sensitivity shall be irrespective of direction of motion. Sensor shall also alarm at velocities faster than 0.1 foot per second, up to 10 feet per second. Sensor shall not alarm in response to general area thermal variations. Mount sensors near ceiling on vibration-free surfaces as indicated. Electronic circuitry shall be solid state and mounted on printed circuit boards. Sensor elements shall contain circuitry for transmitter drive, signal processing, tamper circuitry, and power supplies. Circuitry shall provide an alarm relay with Form A contacts capable of carrying 100 mA at 30 volts dc
4. Sensing Range: The sensor shall be wall or corner mounted as indicated. The sensor shall provide a protected area that in top view has dimensions of 50 feet long by 40 feet wide.
5. Motion detectors are to be identified permanently with their zone assignment number
6. Approved Manufacturer: The motion sensor shall be Intellisense Model DT-450T, DT-906, and IS-280CM.

2.10 GLASSBREAK DETECTOR

- A. Approved Manufacturer: The glassbreak detector shall be Honeywell Model No. FG-1625.

2.11 CABLES

- A. All cables shall utilize standard copper conductors with minimum 300 volt rated insulation. The outer jacket of each cable shall be labeled to denote the manufacturer's name, catalog number, cable size, and UL classification. Approved cable manufacturers are specified below. All cables shall be as indicated on the drawings.

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1. Approved Cables:
 - a) Belden #8444 – 4 conductor, #22 AWG, non-shielded (use for door contacts and motion sensors)
 - b) Belden #9156 – 2-pair, #18 AWG, non-shielded (use for data runs up to 500 feet)
 - c) Belden #8620 – 4-conductor, #16 AWG, non-shielded (use for data runs up to 750 feet)
 - d) Belden #8489 – 4 conductor, #18 AWG, non-shielded (use for keypad, run not to exceed 500 feet)
 - e) Belden #8620 – 4 conductor, #16 AWG, non-shielded (use for keypad, run not to exceed 750 feet)
 - f) Genesis – 12 conductor, #22 AWG (for future annunciators)
2. Cable connections shall be made with both “B” type sealant filled connectors and nylon type terminal strips Newark Electronics # 31F2436 and # 31F2440.

PART 3 - INSTALLATION

3.1 INSTALLATION

- A. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations. All wiring shall be installed in strict compliance with all the provisions of NEC.
- B. **The existing systems shall remain intact and fully operational until all new systems have been tested, inspected and approved. If existing systems are taken off-line, the contractor will be responsible for providing a guard onsite (at no additional cost to Owner). Guard shall be onsite 24 hours a day until either the new system is complete and fully operational or the existing systems are brought back on-line.**
- C. The contractor shall clean all dirt and debris from the inside and the outside of equipment after completion of the installation.
- D. End of Line Devices: Shall be furnished as required for mounting as directed by the manufacturer.
- E. All conduits shall be installed in accordance with Specification 16050.

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- F. Pull all conductors splice free. Make all conductor connections under screw terminals. Provide insulated barrier type nylon terminal strips at junction points and as indicated to insure a neat and orderly termination of all cabling. Use of wire nuts, crimped connectors, or twisting of conductors is prohibited. Control panel and peripheral equipment shall be dressed out in a professional manner with all wires running in the vertical or horizontal plane, cut to exact length, making all turns at 90 degree angles, and tightly bundled and wire wrapped.
- G. All motion sensors shall be securely mounted and properly adjusted to monitor the respective areas. Openings in the motion sensor mounting plates shall be completely sealed against outside contaminants (including insects) using clear silicone with particular attention to the wire entry area.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Wire and Cable.

1. The contractor will pull a 22 gauge, 12-conductor wire for future use by the DCPS Security Department (annunciation) in addition to a 16 gauge, 4-conductor wire for the office touch pad location from each control panel.
2. The contractor will install all wire and equipment in accordance with current NEC Electrical Code for Low Voltage Systems.
3. The contractor will pull a 4 conductor fire wire from the new security panel to the existing fire alarm control panel.
4. All wire used in installation of the new system shall be Belden wire (except for future annunciator wire).
5. No existing wiring is to be used. No joints or splices are allowed. All wiring shall be home run to the perspective termination point.
6. No more than 3 wires 18 gauge/4 wires 22 gauge or larger may be inserted under a terminal strip, and no more than 4 wires 18 gauge may be inserted under a terminal screw on the Vista Control Panel or Vista Peripheral Devices.
7. All wiring terminal strip connectors shall be Newark part # 31f2436, 12-position, Warland, Inc., 21.341.6253.0, 160MM), and #31F2440, 12-position, 80MM) or equivalent.
8. Use of tie-wraps (tie-straps) is not permitted. Utilize Velcro for all cable strapping.
9. All terminated wiring must be installed in a neat and professional manner utilizing wire management procedures.

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- B. Equipment, Devices, and Modules
1. The installed devices shall be normally closed (N/C) devices; any normally open (N/O) devices will be replaced with normally closed (N/C) devices.
 2. The security system data point devices (Ademco part #4190SN, #4208U, and 4208SN modules) are to be labeled, installed in groups, and housed in cabinets to be accessible for servicing. The modules are to be installed on wooden backboards inside the cabinets. The 4208U and 4208SN (8 point modules) shall be used as the primary devices. Resistors shall be terminated on the modules with unused zones terminated with resistors. Recommended location is indicated on map, other locations may be considered for acceptance.
 3. The contractor will provide security device locator maps and "as-built" diagrams on CD in a compatible graphic file format and a printed form. Copies of updated maps must be located on-site and in the Security Office's Central Station before monitoring of new equipment can proceed.
 4. All devices, both new and existing, will independently report signals to the Central Station receiver.
 5. Ademco part number 4297 polling loop extenders are to be installed on all data loops, supplied power from the power supply units, and installed at the Vista control panel location.
 6. All 4190SN, 4208U, 4208SN modules, power supplies, terminal strips, etc. are to be installed with hardware fasteners. Double-sided tape used to secure these devices will not be acceptable.
 7. All devices being utilized by the new security system shall be identified on each individual device. Old device numbers are to be removed at time of re-identification (i.e. Door Contacts, Motion Detectors, and Polling Devices).
 8. Existing devices to be reused shall be tested. The DCPS Security Department shall be notified of any existing devices, which are found to be inoperative at which time the DCPS Security Department will provide an equal device for its replacement but said device should be installed by the contractor at no charge.
 9. All devices, panels, modules, or any equipment related to the old security system which is not being utilized by the new system shall be removed and returned to the DCPS Security Department warehouse location at 129 King Street. Old wiring shall be removed and disposed of properly.

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10. All motion detectors must be completely sealed against outside contaminants (bugs) using Clear RTV ® Silicone. (Specifically Wire Entry Area) Classroom and office motion detectors shall have the microwave sensitivity set to half range.
11. The DCPS District shall provide a dedicated voice grade telephone line for the system onsite at the d-marc location. The contractor shall make connection to this circuit, install a standard RJ-31x jack next to the Vista control panel, and identify the telephone circuit on the jack.
12. All zones to be numbered as shown on map. Map provided is exactly what completed install should reflect. Maps are to be located at each keypad location.
13. Keypads to be located as shown on map, installed at 60" AFF.
14. All module boxes to be mounted below drop ceiling.
15. All door contacts and motion detectors are to be installed using #6 ¾" screws with #2 Robinson drive screw head. No "self tapping" screws are to be used.
16. All classroom motion detectors shall be Intellisense DT-450t.
17. Hallway motion detectors shall have the optional narrow lens installed if using the DT-450t.
18. The principal shall determine installation of intercom master and sub master stations exact location in office.

C. Power and Surge Protection

1. Power supplies (Altronix SMP5PM-CTX) are to be supervised for both A/C loss and battery trouble. The power supplies shall be wired directly into a 120vac circuit. DCPS Electricians shall perform this procedure after a written request defining specific locations for said connections is submitted to the DCPS Central Station.
2. Surge protection for A/C (Edco FAS-120AC) and telephone line (Edco PC2-TEL) is to be installed. "Ditek" equivalents for above specified suppressors will be accepted.
3. The contractor may not power the expansion modules from the Vista keypad buss. The Auxiliary Power Supply must power the expansion modules.
4. Power supply current draw measurements shall be taken, dated, and labeled on the inside of the power supply cabinet.

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D. Portables

1. Installations in portables must comply with these specifications. All work must be installed in accordance with the standard DCPS security details and riser diagrams.

E. Access Control

1. Access control doors are to utilize Intellikey system components. Provide all required hardware including, but not limited to electronic cylinders, locksets, keys and programming equipment.
2. Power shall be hard-wired or provided via batteries as specified on drawings.
3. All exposed wiring is to be installed in conduit or in wire molding with no more than a total of three feet of wire molding per instance.

The DCPS Lock Department will inspect the Intellikey system. Any questions may be directed to them @ 630-6666.

3.3 QUALITY ASSURANCE

- A. The electrical contractor shall install all conduit, enclosures, back boxes, and wiring required for the installation of the Intrusion Detection System. However, all security devices, control panels, etc. shall be installed and tested by a trained representative of the security equipment contractor.

3.4 IDENTIFICATION

- A. Conductors: All wiring shall be color coded throughout as directed by the Owner, maintaining a uniform code throughout the entire system. All conductors shall be labeled at the Main Control Panel, intermediate junction boxes, and terminal cabinets. Labels shall be self-stick adhesive backed vinyl cloth wire markers.
- B. Devices: All security initiating devices shall be neatly labeled to indicate the respective zone. The locations of all end-of-line devices shall be clearly indicated.

3.5 GROUNDING

- A. Main Control Panel and transient protection devices shall be grounded in accordance with the manufacturer's recommendations.

3.6 TESTING

- A. Upon completion of the installation, the contractor shall submit complete device descriptions and zone location information (including zone serial numbers) to the DCPS Central Monitoring Station. Once this information has been received and reviewed and upon a minimum 48-hour notice from the contractor that the installed

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system is ready to be programmed, the DCPS Central Monitoring Station will program the system. The contractor must be onsite during programming to assist with the uploading of the programming information.

- B. Once programming is completed, the contractor shall test each individual device for proper operation. Upon completion of this preliminary testing, the contractor shall arrange for sending test signals to the DCPS Central Monitoring Station as directed by the Owner. Transmission of these test signals shall be accomplished in the presence of a DCPS security department representative. The contractor shall correct defects and conduct additional tests as directed by the security department representative as necessary to demonstrate that the system conforms to the contract specifications.
- C. Upon successful testing of all devices to both the main security panel and the DCPS Central Monitoring Station, an appointment will be scheduled with the DCPS security personnel to perform a walk through test and inspection with both parties present. The contractor shall provide DCPS security personnel with electronic drawings of security maps at a minimum of 2 weeks prior to this inspection. Electronic drawings of maps shall be provided on CD in AutoCAD Release 2006 format. Drawings shall indicate device locations and zoning information and be sized to fit 8.5" x 11" pages. When more than 1 map is required, an overall key plan shall be included on each map.
- D. Additional testing shall include testing of volts DC between the negative (keypad) and the ground at the panel. Reading must be less than 1.05 VDC and greater than 0.972 VDC. Test results must be recorded and sent to DCPS security personnel for their records.
- E. For systems with multiple control panels, all testing shall be performed separately for each control panel. During the testing of one panel, all other panels shall be completely shut down and powered off.

3.7 TRAINING

- A. Upon completion of the work and at a time designated by the Owner, personnel at the school shall receive a complete training session of a minimum of 2 hours. The training shall include an explanation and review of the theory of operation, the function, description, arming, and disarming procedures as a minimum. The instructional personnel providing requirements above shall be fully trained to provide instruction services. The training shall take place at the site. Obtain a signed roster of all personnel that attend the training sessions and submit the roster to the DCPS security department.

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3.8 WARRANTY

- A. The contractor's warranty shall provide for inspection of all trouble issues within 12 months of system acceptance. When contacted by DCPS, the contractor shall visit the site and determine cause of trouble at no cost to Owner. The contractor shall correct any problems related to product failure or system installation. If the trouble was the result of an event beyond the control of the contractor (vandalism, act of nature, etc.), the contractor shall notify DCPS of cause of trouble.

END OF SECTION