SHEET

SECTION 16721 PART 2 - - PRODUCTS A. Red finish exterior rated with metal gong, and metal shield. B. Supervised by fire alarm FIRE ALARM SYSTEM 2.1 ACCEPTABLE MANUFACTURES C. 8-inch diameter gong or diameter as required A. Silent Knight by Honeywell D. Include weatherproof flush wall mounted box PART 1 - - GENERAL E. Provide as required by Fire Sprinkler requirements 2.2 KEYS & EQUIPMENT KEY BOX (KNOX BOX) F. Silent Knight 1.1 WORK INCLUDED A. Access keys to locked fire alarm equipment shall be placed in a lock box approved by the Fire Marshal. A. Provide a complete and satisfactory operating automatic, class B, addressable fire alarm and 2.14 MAGNETIC DOOR HOLD Provide Lockbox unless otherwise provided by other divisions. See Arch. A. 24 Vdc, compatible with fire alarm system B. Rated for door held B. Provide all components, equipment, materials, and connections for complete system. 2.3 FIRE ALARM CONTROL PANEL (FACP) C. Coordinate with Division 8 for mounting and additional requirements. Provide all required fire alarm shop drawings as required by Fire Marshal for permit review. A. Features: 1. Multi-processor-based for fire and releasing system applications 1.2 REGLATORY REQUIREMENTS 2.15 COMBINATION HORN & STROBE 2. UL listed A. Electronic Horn A. National Fire Protection Associations (NFPA) 3. Signal precedence- Life Safety signals take precedence 1. NFPA 70 National Electrical Code 1. Provide selectable temporal (Code 3), chime, or whoop tones. 4. 380 analog/addressable points per panel 2. NFPA 72 National Fire Alarm Code 5. up to 5 fully supervised network remote annunciators 2. Selectable high / low horn sound levels measured at 10-feet for both sounds not less than 90 dBA B. Underwriters Laboratories (UL) 6. DACT support 1. UL 38 Standard for Manual Signaling Boxes for Fire Alarm Systems B. Electronic Strobe 7. 576 chronological event history log 2. UL 228 Door Closers-Holders, With or Without Integral Smoke Detectors 8. System control for reset, alarm silence, local silence, drill, status, program, and test 1. Synchronized with other strobes 3. UL 268 Standard for Smoke Detectors for Fire Alarm Signaling Systems Sensitivity Reports and Sensitivity testing 2. Flash rate of 1Hz to 2Hz 3. Field selectable candela ratings. 4. UL 268A Standard for Smoke Detectors for Duct Applications 10. Internal time clock, date, password, reset memory functions 5. UL 346 Waterflow Indicators for Fire Protective Signaling Systems 4. Provide candela rating as noted and required. 11. Device supervision 6. UL 464 Audible Signaling Appliances C. Housing Color: White, red if white not available or allowed. 12. Ground fault indication 7. UL 521 Heat Detectors for Fire Protective Signaling Systems 13. Audible and visual indicators 8. UL 864 Standard for Control Units and Accessories for Fire Alarm Systems 2.16 HORN 14. Separate power-on indicator 9. UL 1481 Power Supplies for Fire Protective Signaling Systems 15. Addressable auxiliary contacts: Form C not less than 2, expandable as required. A. Electronic Horn 10. UL 1971 Signaling Devices for the Hearing-Impaired 16. Detector sensitivity capable of being changed from control panel 1. Provide selectable temporal (Code 3), chime, or whoop tones. C. 2009 International Building Code 17. Supports Class A or Class B wiring. 2. Selectable high / low horn sound levels measured at 10-feet for both sounds not less than 90 dBA D. 2009 International Fire Code B. Provide dedicated 120 Volt 20Amp circuit, clearly labeled as Fire Alarm, connected to emergency generator. C. Mircom listed for smoke evacuation system. 3. Exterior horns shall be rated for exterior use and be Weatherproof 1.3 SUBMITTAL AND INSPECTION REQUIREMENTS B. Housing Color: White for interior locations red for interior location if white not available or permitted, A. Provide no less than three complete sets of fire alarm shop drawings as required by fire marshal 2.4 ANNUNCIATORS Red for exterior locations. for permit review A. Receipt of alarm, trouble, and supervisory signals shall activate integral audible devices at annunciators 2.17 MINI-HORN B. Pay all plan review fees prior to picking up the approved set of documents. Provide Owner and B. The annunciator shall contain the following system status indicators: A. One-gang flush installation Architect with a copy of the approved plans. 1. 80 character Backlit Liquid Crystal Display. B. Housing color: white, red if white not available or permitted. C. Provide fire alarm operational matrix showing system programming. Indicate all unique initiating 2. System Power Indicator. device types on individual rows. Show all output and notification actions along the columns 3. System Common Alarm 2.18 STROBE and indicate with an "X" what output and notification action will be programmed with associated 4. System Common Trouble A. Electronic Strobe initiating device activation. Refer to NFPA 72 Handbook as an example. 5. System Common Supervisory 1. Synchronized with other strobes. D. Provide all fire alarm shop drawings requested by Fire Marshal and outlined, and per International System Common Monitor 2. Flash rate of 1Hz to 2Hz Fire Code Section 907.1.2. 7. System Ground Fault 3. Field selectable candela ratings of 75 or 110 1. Floor plans with room type and numbers 8. System CPU Fault System Disabled 4. Provide not less than 75cd strobes unless specifically noted as less intensity. 2. Mounting heights of all components 9. System Test Point(s) 5. Provide candela rating as noted. 3. Locations of all initiating and notification equipment 10. System Reset Switch with LED. B. Housing Color: White, red if not available or permitted. 4. Control and trouble signaling equipment 11. System Alarm Silence Switch with Integral LED. 2.19 SPEAKER/STROBE VOICE EVACUATION SPEAKER Annunciation 12. System Local Silence Switch with Integral LED. 6. Power Connections A. Electronic Strobe 13. System Drill Switch with Integral witches. 7. Battery Calculations 1. Synchronized with other strobes. C. The Annunciator shall have lockout protection with key on annunciator or password protection. Include 8. Conductor type and size 2. Flash rate of 1Hz to 2Hz key or password written in Knox Box. 3. Field selectable candela ratings of 75 or 110 Voltage drop calculations D. Flush mount 10. Schematics and termination to source wiring diagram 4. Provide not less than 75cd strobes unless specifically noted as less intensity. E. Silent Knight annunciator 5. Provide candela rating as noted. 11. Equipment List and Manufacturer 12. Details of ceiling height and construction material B. Housing Color: White, red if not available or permitted. 2.5 POWER SUPPLY 13. Interfaces and innertied equipment A. Operation: 14. Listing information 1. Transfer to battery power without loss of signal upon loss of normal power, or drop in normal voltage. 1. Provide selectable temporal (Code 3), chime, or whoop tones. E. Submit all testing data to Fire Marshal, Owner, and as requested by Architect. 2. Audible and visual indicators shall show loss of normal power. 2. Selectable high / low horn sound levels measured at 10-feet for both sounds not less than 90 dBA F. Additional requirements as specified and shown on drawings. B. Battery 1. Provide 24 hours operation and then operated full alarm condition for at least 5 minutes per NFPA 72. 1.4 SYSTEM DESCRIPTION Dual voltage. 2. 24 Volts DC A. EQUIPMENT 3. Include charger, protection, expiration, and over/under charge indication 1. Provide a complete, supervised, new fire alarm system consisting of all required equipment, equipment shown on Drawings, and equipment as listed: A. UL Listed limited power cable for fire system signaling 2.6 DIGITAL ALARM COMMUNICATIONS TRANSMITTER (DACT) B. Size not less than 18 AWG, solid, color-coded Red PVC jacket, shielded where required by manufacturer. a. All required conductors, cables, connectors, and protection of such. b. Control panels A. The system shall provide a Digital Alarm Communications Transmitter (DACT) capable of transmitting C. Notification appliances cable shall be sized not less than 14 AWG. D. Provide quantity and type as required by the manufacturer. c. Power supplies and uninterruptible power supplies system alarm, trouble and supervisory events to a central monitoring station. The DACT shall support d. Notification Appliance Circuit (NAC) supplies E. Provide plenum rated cables where routed through air plenums. dual telephone lines, 20 PPS 4/2 communications, and non-proprietary communication protocols, and F. Belden as approved by manufacturer, or approved. e. LCD Remote Annunciators configured for dual tone multi-frequency or pulse modes. It shall be possible to delay AC power G. Avoid installing EOL resistors in private suites. End circuits in common areas of the building. f. Manual Pull Stations failure reports, auto test call. B. Silent Knight g. Area Smoke detectors PART 3 - - EXECUTION h. Area Heat detectors 2.7 MANUAL PULL STATIONS i. Duct Smoke detectors j. Fire Sprinkler waterflow, and valve supervisory switches A. Analog/addressable of polycarbonate construction and incorporate an internal toggle switch. Provide A. See Raceway Specifications for additional requirements. k. Fire Sprinkler waterflow bell wet-location where located on exterior of building. Provide locked test feature. The station shall be B. Do not support by staples or other mechanical means where support can pinch or damage cables. I. Interface equipment with monitoring and/or supervision (i.e. suppression system, HVAC finished in red with "PULL IN CASE OF FIRE" lettering indicating operation of pull station. shutdown, etc.) D. Label conductors at all junction points, include circuit and device number and function. Label all junction m. Synchronization Equipment B. Single gang mounting n. Visual, and Audible Notification Appliances C. Key reset: after station has been pulled, unauthorized personnel cannot reset it. boxes as "FIRE ALARM D. Silent Knight, Compatible equal for wet-locations. o. Magnetic Door Holders E. Provide not less then two telephone lines in protective raceway to FACP/DACT Location. p. Elevator Recall and Shunt-Trip modules F. Ground all shielded cables and ground conductors per manufacturer requirements. Test, record, and 2.8 HEAT DETECTOR q. Central Station monitoring connection provide ground resistance. r. Option to Owner for monitoring contract A. Analog/addressable combination fixed temperature / rate-of-rise detector. B. Fixed temperature alarm point rating of 135°F (57°C) and a rate of rise alarm point of 15°F(9°C) per B. SEQUENCE OF OPERATIONS minute unless otherwise noted. 1. General operation and general building alarm C. Plug-in Base a. Upon activation of initiating device: All horns shall sound, Strobes flash in synchronization, D. Rated for ceiling installation and wall mount installation. HVAC equipment shall shutdown, held doors shall close, fire/smoke dampers shall close. Location of initiating device(s) in alarm annunciated at Master panel, location of E. Silent Knight initiating device(s) in alarm annunciated at remote annunciators, central monitoring 2.9 SMOKE DETECTOR company contacted, additional programmed outputs activate (i.e. connections to HVAC A. Features: controls, elevators, water flow sprinkler bell, etc), system logs event and time of event. 1. Optical sensing, photoelectric analog/addressable with remotely 2. See Detailed Operation (this section Part 3) programmable sensitivity settings. C. Duct Smoke Operation 2. Maintenance/clean alert. 1. Upon Alarm activation of any duct smoke detector, the following functions shall automatically occur: 3. No moving components a. Location and time of alarm, alarm type, and visual and audible indication shall be 4. Local alarm LED indicator to show trouble and alarm signals annunciated at all annunciator locations and logged in system memory. 5. Hardware to prevent tampering b. A remote LED at the duct detector location associated with the alarm shall be illuminated. 6. Remote alarm indicator connection c. Transmit an alarm signal to the central station.

7. 24V DC 2-wire operation d. Shutdown the local air handling unit and close associated air handling unit Fire/Smoke dampers

8. Separate individual identification of each detector. 9. Voltage/circuit monitoring, indicate trouble to fire alarm control panel. b) 2- Signal sent to HVAC automatic control system from fire alarm to shutdown all HVAC units.

> 2.10 RELAY BASE SMOKE DETECTOR A. Same as Smoke Detector and include Relay Base. B. Relay Base to include the following features: 1. 1-gang or round ceiling box mounting 2. Selectable normally open or normally closed relay contacts

3. Supervised contact position 4. Local detector operation 5. 1Amp 30V DC rated for pilot duty

C. Silent Knight. 2.11 DUCT SMOKE DETECTOR

A. Same as Smoke Detector and include additional features: 1. Duct Detector Housing Relay Base

3. Sampling tubes 4. Remote keyed Test switch 5. Remote keyed reset switch 6. Remote LED alarm indication

B. Connected, and tested by Division 16. Furnished, located, sampling tubes sized and adjusted, and installed by Division 15.

C. Provide remote test, reset, and alarm indicator assembly and locate where not concealed and is accessible. D. Compatible with Silent Knight.

E. Compatable with Fire Alarm System.

2.12 AREA BEAM COVERAGE DETECTOR A. Rated for area and length covered by detector. B. Integral test switches. C. Remote test switch cabability D. Switch per Fire Marshal requirements.

> HVAC EQUIPMENT WITH FIRE SMOKE DAMPERS AS PART OF THE HVAC EQUIPMENT DISTRIBUTION SYSTEM SHALL SHUT DOWN UPON GENERAL ALARM REGARDLESS OF CFM RATING. INCLUDING BUT NOT LIMITED TO SF-2. HVAC EQUIPMENT OVER 2000 CFM TO INCLUDE DUCT SMOKE DETECTORS AND HVAC EQUIPMENT TO SHUT DOWN UPON GENERAL ALARM. SEE SPECIFICATIONS. SEE MECHANICAL.

AUTOMATIC FIRE ALARM SYSTEMS SHALL BE ANALOG INTELLIGENT ADDRESSABLE FIRE DETECTION SYSTEMS DESIGNED IN ACCORDANCE WITH NFPA AND IFC.

EACH RESIDENTIAL UNIT SHALL BE EQUIPPED WITH FIRE ALARM HORNS (MINI-HORNS) TO PROVIDE THE ADEQUATE DECIBEL LEVEL IN ACCORDANCE WITH NFPA 72.

UL FILE #: 387398-001

FIRE ALARM DRAWINGS INCLUDED ARE SCHEMATIC AND

COORDINATE DESIGN WITH THE INTERNATIONAL FIRE CODE

NFPA 72, LOCAL AMENDMENTS AND LOCAL FIRE MARSHAL

MONITORING COMPANY

DBA COPS MONITORING

HUNT VALLEY, MD. 21031

ADDRESS: 235 SHILLING CIR. SUITE 108

LYDIA SECURITY MONITORING INC.

ARE FOR REFERENCE ONLY SHOWING MINIMUM

REQUIREMENTS. FIRE ALARM DESIGNER SHALL

UTILIZE CLASS B WIRING METHOD.

CONTRACTOR TO SUBMIT REQUIRED DRAWINGS TO AHJ FOR REVIEW AND APPROVAL. SEE SPECIFICATIONS SHEET. ELECTRICIAN TO OBTAIN AND PAY FOR PERMIT(S) FOR FIRE ALARM

INSTALLING LOW VOLTAGE CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING WIRING LAYOUT AND ARRANGEMENT. SUBMITTAL TO INCLUDE BATTERY AND VOLTAGE DROP CALCULATIONS FOR LAYOUT SUBMITTED.

1) Two methods shall be used to assure air handling unit shutdown:

e. General building alarm shall sound unless supervisory signal is approved and preferred by

c. System fault as outlined by NFPA and UL impeding ability of system to activate all

annunciated at all annunciator locations. Event to be logged in system memory.

a. Location and time of activation, activation type, and visual and audible indication shall be

a. Location and time of activation, activation type, and visual and audible indication shall be

annunciated at all annunciator locations. Event to be loged in system memory.

a) 1- Local relay with duct detector shall shutdown unit.

Authority with Jurisdiction and Owner.

D. Fire Sprinkler Water Flow or Suppression System Activation

b. Fire Sprinkler Bell Sounds for water flow only.

b. Moving sprinkler valve from full open position

e. Otherwise noted, required, or indicated herein

b. Transmit an alarm signal to the central station.

g. Otherwise noted, required, or indicated herein

b. Transmit an alarm signal to the central station.

2. The following functions shall automatically occur:

b. Open, short or ground-fault in initiating or notification wiring

c. Removal of any initiating or notification appliance from the system.

2. The following functions shall automatically occur:

a. Battery or charging system failure

1. Activation caused by:

1. Activation caused by:

E. Supervisory Operation

d. Elevator fault

F. Trouble Operation

1. Activation caused by:

d. Normal power failure

e. System component fault

System fault

f. Dirty detector

a. General Building Alarm

notification appliances

A. Properly support and secure all fire alarm equipment to building materials suitable to support equipment. B. Surface mount EACP. C. Label all fire alarm equipment with "NOT IN SERVICE UNTIL ACCEPTED". Remove labels after acceptance. D. Pre-test all system components. 1. Make required adjustments to horns for sound level of 15 dBA above ambient and at levels as required in sleeping areas. Notify Architect if additional horns are required. 2. Properly identify equipment and location through system programming. 3. Provide all forms required by Fire Marshal for acceptance testing. E. Test system prior to Fire Marshal acceptance. Coordinate with Fire Marshal for test day requirements, such as disconnecting system from normal power. F. Test system according to NFPA 72. Provide NFPA 72 test report to Fire Marshal, and as requested by PROVIDE LOW FREQUENCY Owner, and Architect. G. Conduct, and record the results from the following tests: NOTIFICATION IN SLEEPING ROOMS. 1. As required by Fire Marshal smoke spray) in addition to each device's testing switch. Verify proper annunciation of each SEE SMOKE CONTROL SHEETS SC1.1-SC2.1 FOR device location, type, and alarm condition. ADDITIONAL FIRE ALARM REQUIREMENTS.

2. Check for improper voltage levels between circuit conductors and to ground. 3. Check for low-impendence path to ground on ungrounded circuits, megger test for values less than 1-MegaOhm. 4. Test conductor insulation for short circuits. 5. Verify panel is in normal status per manufacturer's recommendations

6. Test each initiating smoke and heat detecting device by manufacturer approved means (such as 7. Test battery backup as recommended by manufacturer.

8. Test silence function. 9. When system is in alarm drop-out not less than 10% of devices from system to verify fail-safe operation. 10. Verify proper shutdown of all HVAC equipment through duct detector activation. 11. Simulate the activation of Fire Sprinkler water flow and suppression activation.

12. Remove NAC and other system components, verify trouble signal during normal system status. H. Correct deficiencies indicated by testing. Retest all system components that were replaced or altered as a result of testing. Verify operation of system affected by corrected deficiencies.

I. Provide complete system programming. J. Set strobes/horns per AHJ and code requirements including ADA requirements...

K. Trouble signals shall be indicated regardless of status of FACP or device. Signals that appear only upon alarm condition or when the device is activated are not acceptable. Program system automatic cycled testing as required by NFPA, and recommended by manufacturer.

3.3 DETAILED OPERATION A. General 1. Install and program system for proper operation per NFPA 72. System operation to include alarms. diagnostics, supervision, activation, and automation as required by Local Building Code and local

requirements. 3.4 CLEANING A. Remove all foreign construction materials, dirt, and debris from system equipment. Replace damaged equipment. Clean components using materials and methods as recommended by manufacturer.

3.5 TRAINING A. Provide factory-authorized service representative to train and demonstrate system operation.

3.6 CERTIFCATION A. The installer shall provide written certification to the Owner and Fire Marshal that the system has been

installed in accordance with the approved plans and specifications. B. Provide contact information of installer. C. Provide written list of all component part numbers, device addresses, and panel annunciation verbiage

associated with respective device for Owner. D. Revise panel annunciation verbiage as required by Fire Marshal.

END OF SECTION

PRIOR TO BID.