SECTION 283101 - PROTECTED PREMISES FIRE ALARM SYSTEM

This section should be used for a building which is required to have a New York State Uniform Fire Prevention and Building Code Fire Alarm System (NYSUFP and BC 774.2) or Fire And Smoke Detecting System (NYSUFP and BC 774.3).

This section covers a system which has one or more microprocessor based fire alarm control panels having fire alarm, control, and real time capabilities. Initiating and control devices are hard wired or multiplexed to the FACP(S). Where multiple FACP’S are used, they are multiplexed to each other.

In addition to the NYSUFP and BC this section was written to meet:

1. For the building: NFPA 72 Chapter 3 protected premises fire alarm systems.

2. For multiple buildings (in conjunction with section 283103): NFPA 72 5-3 proprietary supervising station systems.

3. For alarm retransmission to the fire department, either:

a. NFPA 72 5-4 remote supervising station fire alarm systems when system is connected to remote station.

b. NFPA 72 6-16 auxiliary fire alarm systems, when system is connected to municipal fire alarm system.

4. The essence of all the additional codes, standards and references listed under information at end of section. However, you must evaluate the codes and standards for requirements which are relevant to only specific applications such as hospitals, other health and mental care facilities, educational facilities, industrial buildings, day care areas, retail sales areas, storage facilities, hazardous areas, NYC projects, etc. And modify this section to accommodate their special requirements.

This section may not be suitable for many occupancies in NYC. They may require type of system specified in section 283102, whether or not the building is over or under 100 feet tall. Occupancy load is a factor. Refer to NYC Building Code Subchapter 17, Article 5 27-968, 27-971, 27-972.

See information at end of section.

1. GENERAL
   * + 1. RELATED WORK SPECIFIED ELSEWHERE

Evaluate need for video training program.

* + - * 1. Video Training Programs: Section 017900.

Include section 283103 when section 283101 is part of a proprietary fire alarm system (NFPA 72 5-3).

* + - * 1. Integrated Protected Premises/Proprietary Fire Alarm System: Section 283103.

Include section 271525 for OGS projects, if there is more than one FACP.

* + - * 1. Optical Fiber Cables: Section 271525.
      1. REFERENCES
         1. Underwriters Laboratories Inc.

In paragraph below add “and 13” for sprinkler system alarm and supervision. Add “and 20” for fire pump supervision.

* + - * 1. National Fire Protection Association Standard 72.
      1. DEFINITIONS
         1. Initiating Device Circuit: A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated. Example:

Circuits from FACP to non-addressable signal initiating devices.

* + - * 1. Notification Appliance Circuit: A circuit or path directly connected to a notification appliance. Example:

Circuits from FACP to notification appliances.

* + - * 1. Signaling Line Circuit: A circuit or path between any combination of circuit interfaces, control units, or transmitters over which multiple system input signals or output signals, or both are carried. Examples:

Omit subparagraph below if only one FACP is used

Circuits between FACP’s.

Circuits from FACP to addressable devices.

* + - * 1. Operating Mode:

Private Mode:

Audible and visible signaling only to those persons directly concerned with the implementation and direction of emergency action initiation and procedure in the area protected by the fire alarm system, and:

Audible and visible signaling only to those persons within special designated areas where private mode operation is specified to be applicable.

Public Mode: Audible and visible signaling to occupants or inhabitants of the area protected by the fire alarm system.

* + - 1. SYSTEM DESCRIPTION

For single panel project, omit reference to ICU’S throughout system description (MFACP terminology is applicable to a single panel or multiple panel building).

* + - * 1. The system operates as a multiplexed protected premises fire alarm monitoring and control system.

Use five subparagraphs below for multi-panel building.

In Building With More Than One Fire Alarm Control Panel: Changes in the status of monitored points are indicated at the microprocessor based main fire alarm control panel (MFACP), utilizing distributed processing, peer-to-peer networked, interconnected control unit’s (ICU’s) located throughout the building.

Show emergency lighting at MFACP. Show a smoke detecting device in each area where fire alarm panels are installed (NFPA72 1-5.6).

The network micro-processors continually monitor the communications and data processing cycles of the system.

A communications failure indication (print-out, display and audible alarm) occurs at the MFACP upon failure of the network communication and data processing cycle.

Upon MFACP failure, an audible and visible alarm activates.

Complete failure of the MFACP does not interfere with the ability of each ICU to perform its functions.

Use two subparagraphs below for single panel building.

In Building With One Fire Alarm Control Panel: Changes in the status of monitored points are indicated at the microprocessor based main fire alarm control panel (MFACP).

The MFACP continually monitors the communications and data processing cycles of the micro-processor. Upon MFACP failure, an audible and visible alarm activates at the MFACP.

Smoke detectors and smoke sensors operate in conjunction with the systems’ alarm verification program.

In areas where alarm verification feature is desired for additional protection against false alarms or unwarranted discharge of fire suppression systems, alarm verification zones for smoke detectors, or individual smoke sensors operating in verification mode must be indicated on the drawings. Refer to NFPA 3-8.3.2.3.1.

The alarm verification operation is selectable by zone for smoke detectors and by individual devices for smoke sensors.

The activation of any smoke detector within its zone initiates the alarm verification program.

The panel resets the activated detector and waits for a second alarm activation. If within one minute a second alarm is reported from any detector within the zone, the system alarms. If no second alarm within one minute, the system resumes normal operation.

The system can display the number of times (tally) a smoke detector zone or smoke sensor has gone into a verification mode. A trouble condition occurs when the tally reaches a pre-programmed number.

Smoke sensors act as intelligent and addressable devices. The smoke sensor converts the condition of its smoke sensing chamber to an analog value. This analog value is digitized and transmitted to the FACP(s).

Actual smoke density and temperature measurements are referenced from average sample measurements and are compared to programmable values of threshold sensitivity.

Sensor “dirty” and “excessively dirty” trouble conditions are reported automatically through a maintenance advisory and alert program procedure.

The system continuously performs an automatic self-test routine on each sensor that checks sensor electronics to ensure the accuracy of the values being transmitted to the FACP(s). Sensors that fail are identified and indicate a trouble condition.

System automatically performs NFPA 72 sensor sensitivity testing by:

Frequent routine individual sensor alarm simulation testing.

Trouble signal when sensor is outside its acceptable sensitivity range.

System individually identifies each addressable initiating device and other addressable monitor functions using multiplexing techniques.

System is capable of individually operating each alarm notification appliance, and other control functions, using multiplexing techniques.

Alarms are processed by the system at 3 levels of priority:

Fire alarms, supervisory, and trouble signals take precedence in that respective order of priority, over all other signals.

Other alarms that require interaction by the attendant have the second level of priority.

Monitored points that do not require interaction by the attendant are the third level of priority.

Omit reference to printing in the next several subparagraphs if printer is not desired.

Alarms, supervisory signals, and trouble signals are distinctively and descriptively annunciated.

Fire alarm signals are distinctive in sound from other signals, and this sound is not used for any other purpose.

Supervisory signals are distinctive in sound from other signals.

System differentiates between supervisory device activation and trouble (wiring faults) on independent supervisory service initiating circuits.

Trouble signals are indicated by distinctive audible signals. Exception: The same sound may be used for both supervisory signal and trouble signal if distinction is made between signals by visible annunciation.

Switches for silencing audible trouble and supervisory signals transfers the audible signal to an identified lamp or other visible indicator adjacent to the switches. The visible indication persists until the condition has been corrected. The audible signal sounds when the switch is in its silence position and no trouble or supervisory condition exists.

Trouble silencing switch does not prevent sounding of supervisory signal. Subsequent supervisory signals from other zones causes the supervisory signal to resound. A switch left in the silence position where there is no supervisory off-normal signal operates a visible signal silence indicator and causes the trouble signal to sound until the switch is returned to normal.

A silenced audible trouble signal resounds at programmable time intervals (every 24 hours or less) as a reminder that the trouble condition has not been corrected. Re-sounded signal is retransmitted to all locations required of the original trouble signal.

System visible and audible trouble signals and supervisory signals and visible indication of their restoration is indicated at the MFACP.

Omit subparagraph below for single panel project.

Each ICU’s visible and audible trouble signals and supervisory signals and visible indication of their restoration is indicated at the ICU.

Monitoring of ground fault conditions indicate a ground fault trouble condition at the MFACP.

Access to the system functions are controlled thru at least 3 levels of access security to prevent program modifications or use by unauthorized personnel:

At the lowest level of access the system automatically receives, displays and prints alarms, and performs control-by-event life safety functions. The attendant has minimum access to the system functions:

Alarm acknowledge.

Print alarm summary.

Silence alarms.

Perform other basic system functions that require interaction by the attendant (cannot change program parameters).

At mid-level of access, the attendant may change user programmable parameters and print all summaries.

At the highest level of access, programs may be modified by the system manager (life safety control-by-event programs may be field or factory modified).

System access functions (log on, log off, access level authority) are displayed and printed with date, time, and person's name.

Omit reference to printing in subparagraphs below if printer is not required.

Summary reports are displayed and printed at the MFACP upon appropriate function command. Active control points are identified by an assigned message. Spare control points are identified by a point number. The summary reports can be interrupted and terminated and the system returned to normal operation by a manual reset control or automatically if the system senses a change of status signal. The summary reports include:

Current Alarm, Trouble, and Supervisory Conditions: Lists all points not in normal state (print and display).

Alarm historical log report.

Trouble and supervisory historical log report.

All Points: Lists every point in the system and current status of the point (print only, display not required).

Control by Event Programs: Lists data for event initiated programs (print only, display not required).

Control by Time Programs: Lists data for time initiated programs (print only, display not required).

Diagnostics:

Alarm verification cycles initiated by a smoke detector zone or individual smoke sensors.

Smoke sensor service report: Device number, device type, custom label, presently selected alarm set point information, present average value, present value, peak observed values, service status.

Smoke sensor status report: Device number, device type, custom label, present sensitivity in % for smoke sensors and in degrees for temperature sensors, present status, and sensor range (normal, almost dirty, dirty).

Devices that fail automatic tests.

Walk test reports.

Life safety control-by-event functions are retained in a non-volatile programmable memory and are not alterable through normal operation of the system.

The life safety control-by-event control points may be manually operated at any time by authorized personnel thru appropriate system commands.

User programmable control-by-event functions may be programmed thru appropriate system commands to automatically activate any user programmable control point upon a status change from any programmable monitor point.

The user programmable control-by-event control points may be manually operated at any time by the authorized personnel thru appropriate system commands.

User programmable parameters for automatic time-initiated functions (start/stop, on/off, secure/access, etc.) may be added, omitted and altered thru appropriate system commands.

The time-initiated user programmable control points may be manually operated at any time by authorized personnel thru appropriate system commands.

Touchscreen and mouse subparagraphs below may be required for OGS projects (an MFACP would need to be suitably equipped).

Touchscreen and mouse commands:

Personnel having the proper system level of access may program and modify all system functions and parameters thru use of touchscreen commands, and mouse “point and click” commands in addition to keyboard commands.

Life safety control-by-event control points, user programmable control-by-event functions, and user programmable automatic time initiated functions in addition to keyboard commands, may also be operated manually thru touchscreen commands and mouse “point and click” commands.

Summary reports, in addition to keyboard commands, may also be displayed and printed thru touchscreen commands and mouse “point and click” commands.

The two subparagraphs may be required for OGS projects, but they are examples from a project and must be verified with OGS for each application (an MFACP would need to be suitably equipped).

OGS Direct Digital Control System Interconnection: The status of each system initiating device, monitored point, life safety control-by-event function, control-by-event function and programmable automatic time-initiated function is transmitted thru a EIA RS-232C port via an Ethernet LAN using the ASHRAE BACnet protocol (or through a protocol sharing arrangement) to the future Direct Digital Control System that controls and operates the building HVAC equipment. The Direct Digital Control System to be installed in the future may be manufactured by one of the following companies:

Johnson Controls, Inc.

Landis Division, Siemens Building Technologies.

Trane, Inc.

An attendant at a remote IBM compatible personal computer may dial in over a telephone line to access the system data. The attendant has minimum access to the following system summary reports:

Standby battery and UPS condition summary.

Alarm summary.

Supervisory signal summary.

Trouble condition summary.

Control-by-event summary.

Programmable automatic time initiated-event summary.

Omit walk test subparagraphs below for small system (also omit reference to walk test from previous summary reports subparagraph).

One person may test the system (walk test).

When in testing mode:

Alarm activation of an initiating device circuit is silently logged as an alarm condition in the historical data file. The system automatically resets after logging each alarm.

The momentary disconnection of an initiating device or notification appliance circuit is silently logged as a trouble condition in the historical data file. The system automatically resets after logging each trouble condition.

The person testing the system may also choose to have the system activate the alarm notification appliances for a maximum of two seconds upon initiating device testing and a maximum of four seconds upon trouble condition testing.

If in the test mode for an inappropriate (programmable) amount of time, the system automatically reverts to normal mode.

The municipal or remote station connection is bypassed.

The system shows a trouble condition.

Control relay functions are bypassed.

Testing groups allow portions of the system to be placed in test mode while the non-test groups remain in normal mode.

* + - * 1. The MFACP activates immediately and performs its alarm functions upon receipt of system alarm condition thru actuation of automatic or manual initiating devices:

The MFACP sounds its audible alarm and illuminates its system alarm lamp or flashing display.

The audible alarm pulses until the system acknowledge button is depressed.

The system alarm lamp remains illuminated until the alarm condition has been corrected and the system reset.

Refer to NFPA 72 1-5.7.3 and NFPA 101 9.6.7 for alarm annunciation requirements.

The MFACP displays the point and type of alarm condition. Addressable devices are individually identified. Groups of non-addressable devices are identified by zones.

Omit subparagraph below if printer is not used.

The MFACP prints the assigned message with date and time on the printer for the point in alarm. Assigned messages, date and time are also printed for the control-by-event functions activated by the point in alarm.

Check with client agency if fire department is to be called, or if other procedures are required (signal must be transmitted to fire department for b4, c6.2 and c6.3 occupancy). Refer to NYSUFP and BC 1060.2(a)(4) AMD NFPA 101 9.6.4.

If fire company is to be called, specify method required by the fire department. Modify subparagraphs below to suit.

References for connection to fire departments through municipal fire alarm systems, public fire alarm reporting systems, or other type supervising stations are: supervising station fire alarm systems: NFPA 72 Chapter 5. Public Fire Alarm Reporting Systems: NFPA 72 Chapter 6.

The fire department is automatically called.

Subparagraph below is an example for auxiliary type operation (local energy, shunt, or parallel telephone). Indicate where the signal is to be sent.

The MFACP activates a relay through the municipal connection and transmits the alarm condition to (\_\_\_\_\_\_\_\_\_).

Omit subparagraph below for shunt type operation or parallel telephone municipal systems where the lines are supervised from the municipal station.

Supervision of wiring between MFACP and relay indicates trouble conditions at the MFACP.

Subparagraph below is an example for remote station type operation. Indicate where signal is to be sent. Change leased lines to other type connection if required.

The MFACP transmits the alarm condition to remote station (\_\_\_\_\_\_\_) via leased lines.

Omit subparagraph below when the leased lines are supervised from the remote station. If a DACT is used, modify all parameters to suit. (refer to NFPA 72 5-5.3.2)

Supervision of wiring between MFACP and remote station indicates trouble conditions at the MFACP.

Subparagraph below is an example of the building fire alarm system transmitting trouble conditions to a supervising station (a facility that receives signals and at which personnel are in attendance at all times to respond to these signals). Indicate name of supervising station (fire department, central station service or other facility meeting criteria of supervising station). Refer to NFPA 3-8.4.4.2.

Trouble conditions received at the protected premises control unit (MFACP), including loss of primary or secondary power are also transmitted to the supervising station (\_\_\_\_\_\_\_). Relays or modules providing transmission of trouble conditions to the supervising station are arranged to provide fail-safe operation.

In subparagraph below change “fire department” to “central station operating company” or other appropriate terminology.

For system test, a switch in the MFACP enables an authorized person to prevent a signal transmission to the fire department. When disconnected, a system trouble condition is indicated, also, a separate lamp illuminates indicating the disconnected mode.

In subparagraph below omit reference to printing if printer is not used.

An authorized person at the MFACP presses the acknowledge button which silences its audible alarm and causes a print-out and display of the assigned message for the point in alarm with date, time and an acknowledge prefix.

Subparagraph below is required by NYSUFP and BC 1060.2( a)(4) for group B4, C6.2 and C6.3 occupancy. Indicate where sign and visible signal is to be located on the premises in a conspicuous location.

A procedure sign located at \_\_\_\_\_\_\_\_ instructs personnel on procedure to be followed in the event of a fire.

Visible signal illuminates drawing attention to the procedure sign.

If a positive alarm sequence alarm or a presignal feature is preferred, modify life safety control-by-event functions below to suit operation. Refer to NFPA 72 1-5.4.11, NFPA 101 9.6.3.3 and 9.6.3.4, and NYSUFP and BC 1060.2( a)(6). There are many occupancies listed in NFPA 101 where either positive alarm sequence or presignal or both are prohibited.

In subparagraph below omit ICU’S for single panel projects.

Show where audible notification appliances are required. Refer to NFPA 72 chapter 4, NYSUFP and BC 1060.2( c), and ANSI a117.1.show sufficient number of audible appliances so that, when tested, the system will meet the specified private and public mode sound level parameters.

Show notification appliance wiring run to MFACP or ICU’S from each area where alarm is to be sounded (floor by floor, area by area, etc). Coordinate wiring with function specified. Refer to NFPA 72 3-8.4.1.1 and 3-8.4.1.3.6.

* + - * 1. Life Safety Control-By-Event Functions: The MFACP and ICU’s immediately performs life safety control-by-event functions upon system alarm condition:

Indicate where building manager alarm annunciators are required. Refer to NYSUFP and BC 791.2, 1060.2(4) and (5).

Building manager alarm annunciators are activated in supervisor’s office, and mechanical equipment rooms, drawing attention to the alarm condition.

Private mode audible signals have a sound level of not less than 45 dBA at 10 Feet, or more than 120 dBA at the minimum hearing distance from the audible appliance. Also, the audible signal has a sound level at least 10 dBA above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet above the floor in the occupiable area.

45 dBA private mode audible signals sound in:

Edit list below. Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, also use the 45 DBA private mode. Specify the areas. Refer to NFPA 72-4.3.3, NFPA 101 9.6.3.6 and 9.6.3.7, and UL 464.3.2.

Supervisor’s office.

Elevator cars.

Restrooms.

Patient sleeping areas.

Reference for subparagraph below is NFPA 72 4-3.1.4, 4-3.3.2 and appendix a4-3.3.2.

Private mode audible signals in mechanical equipment rooms sound have a sound level of not less than 100 dBA at 10 feet, nor more than 120 dBA at the minimum hearing distance from the audible appliance. Also, the audible signal has a sound level at least 10 dBA above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet above the floor.

A voice communication system is required for certain public assembly areas. Obtain information from section 283102 or specify a separate public address system that will meet the code requirements.

Use subparagraph below for non-zoned, non-coded system where the signal is intended for use as an evacuation signal.

Public mode audible notification appliances sound an ANSI S3.41 evacuation signal throughout the building.

Use subparagraph below for zone non-coded system where the signal is intended for use as an evacuation signal.

Audible alarm notification appliances sound a public mode ANSI S3.41 evacuation signal in the alarm signal initiation zone and other zones in accordance with the buildings fire evacuation plan. Evacuation signal is synchronized within each notification zone.

Use subparagraph below for zoned, non-coded system in schools or other locations where vibrating bells may be in use for other purposes (programming, etc.).

Public mode audible notification appliances (single stroke bells) sound a march time evacuation signal with a pulse rate of 120 beats per minute.

Use subparagraph below for zone coded system general applications.

Public mode audible notification appliances (vibrating or single stroke bells) sound 4 rounds of a positive non-interfering successive coded alarm signal.

Public mode audible alarm signals have a sound level of not less than 75 dBA at 10 feet nor more than 120 dBA at the minimum hearing distance from the audible appliance. Also, the audible signal has a sound level at least 15 dBA above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds (whichever is greater) measured 5 feet above the floor in each occupiable area.

The system allows an authorized person to:

Silence any alarm signal in progress through a silence command, but subsequent actuation of initiating devices on other initiating device circuits or subsequent actuation of addressable initiating devices on signaling line circuits causes the system to resound the alarm.

Silencing of an audible alarm does not cancel any visible zone alarm indicators.

A silencing means that it is left in the “off” position when there is no alarm operates an audible trouble signal until the means is restored to normal.

Modify subparagraph below to suit building layout.

Activate the alarm notification appliances on selected floors, and all floors.

Visible indicators in the RA/CC at the MFACP indicate on/off status of the alarm notification appliances.

Reference for subparagraph below is NFPA 101 9.6.3.2.

Alarm signal does not sound in stairwells or elevators.

Actuation of smoke detecting devices in stairwells, or elevator shafts do not sound the alarm signal, but activates all other system alarm functions.

Public and private mode visible alarm notification appliances illuminate and flash a fire warning signal.

Show where visible notification appliances are required. Refer to NFPA 72 chapter 4, NYSUFP and BC 1060.2(a)(7), and ANSI a117.1 chapter 7. Do not show visible alarms and audible alarms connected on the same circuits.

Refer to NFPA 72 4-4 for public mode visible characteristics and NFPA 72 4-5 for private mode visible characteristics.

Public mode flash rate does not exceed 2 flashes per second, nor less than one flash every second throughout the listed voltage range of the appliance.

The maximum pulse duration is 0.2 seconds with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.

NYSUFP and BC 1060.2(a)(7), in schools for the deaf, required fire alarm systems shall be provided with red signal lights in rooms where students congregate, in addition to the sounding devices.

The light source is clear or nominal white and does not exceed 1000 candela (effective intensity).

All strobes are synchronized to flash simultaneously to reduce the probability of photo-sensitive reactions.

Visible alarms continue to flash until the initiating devices are restored to normal condition and the system is manually reset.

References for subparagraph below are NFPA 72 3-9.6, NYSUFP and BC 1060.9 and NFPA 101 7.2.1.8.2, 7.2.1.9.2, 7.2.13.5, 9.6.5.2.

Electromagnetic door hold-open devices de-energize, allowing the associated smoke doors to close.

Coordinate subparagraph below with hardware designers. Refer to NFPA 72 3-9.7 and NFPA 101 7.2.1.5, 7.2.1.6, 9.6.5.2.

Locked doors for re-entry from exit stairwells, exit doors, and emergency exits release their fail safe door lock mechanisms so that associated doors may be opened.

If any of the next several subparagraphs applicable to smoke/fire control are used, refer to NFPA 72 3-9.5, NFPA 90, 92A, NFPA 101 9.6.5.2, and NYSUFP and BC 1004.2(e)(2), (3) and (4), 1004.2(f)(2). Coordinate with HVAC. They may include a smoke/fire control system in their contract. Specify the functions that the automated building HVAC system will control upon signal from the fire alarm system.

Selected HVAC equipment (ventilating fans, air handling units, \_\_\_\_\_\_\_\_) shut down.

Coordinate subparagraph below. In a sprinklered building fire alarm zones may also be same as sprinkler zones.

Fire alarm zones are coordinated with the smoke control zones that they actuate.

Reference for subparagraph above and below is NFPA 72 3-9.5.4.

Include subparagraph below if there is a connection to a DDC system and edit to suit operation. Refer to NFPA 72 3-9.2.5.

Fire alarm zone(s) activated by fire alarm system automatic or manual initiating devices (including sprinkler waterflow switch) causes HVAC equipment to shut down (or perform other required program operation) within the alarmed fire alarm zone(s) thru connection (network or other digital communication technique) to the direct digital building control system.

Reference for subparagraph below is NFPA 72 3-9.5.3, NFPA 90a 4-4.4.2, and NFPA 101 9.6.3.2.

Actuation of air duct smoke detecting devices used solely for HVAC system shutdown sounds the alarm signal and activates all other MFACP alarm functions.

Reference for subparagraph below is NFPA 90 4-2.

Each air distribution system supply, return, and exhaust fan can be manually stopped by the attendant at the MFACP during an emergency.

Reference for subparagraph below is NYSUFP and BC 1004.2(e)(4). Show location of switch.

An emergency switch for each system ventilating an assembly space is located to enable manual shut down of the system in case of fire or smoke. A sign located adjacent to the switch states instructions for system shut down.

Reference for subparagraph below is NFPA 90a 4-4.2 and 4-4.3.

Smoke detectors listed for use in air distribution systems and located as indicated below, automatically stop their respective fan(s) on detecting the presence of smoke:

Downstream of the air filters and ahead of any branch connections in air supply systems having a capacity greater than 2000 ft.³/min.

At each story prior to the connection to a common return and prior to any recirculation or fresh air inlet connection in air return systems having a capacity greater than 15,000 ft.³/min. and serving more than one story.

Reference for subparagraph below is NYSUFP and BC 1004.2(e)(2).

Safety controls operate for every system using recirculated air and serving an area of public assembly, or more than one fire area, or more than one story of a building:

When the air in the system contains smoke of predetermined intensity or has an abnormal rise in temperature, the fans causing normal circulation in such area stops and requires manual reset at the fire alarm control panel.

Reference for subparagraph below is NYSUFP and BC 1004.2(e)(5).

Automatic devices for systems ventilating high hazard spaces stop the fans when the air in the system contains smoke of a predetermined quantity or has an abnormal rise in temperature. Controls require manual reset.

References for subparagraph below is NFPA 101 8.3.5.2 and 8.3.5.3.

Fire dampers and smoke dampers close.

Actuation of air duct smoke detecting devices used solely for the closing of dampers sounds the alarm signal and activates all other MFACP alarm functions.

Reference for three subparagraphs below is NFPA 90a 4-3.

Attendant at the MFACP may manually position the smoke dampers.

Smoke dampers that isolate the air-handling system close automatically when the system is not in operation.

Smoke dampers installed in smoke barriers may remain open during fan shutdown provided that their associated controlling damper actuators and smoke detecting devices remain operational. Dampers close automatically when the fan system they are serving is not in operation.

References for subparagraph below are NFPA 70 645-10 and NFPA 75 8-1.1.

Dampers in HVAC systems serving computer areas and automatic fire and smoke dampers installed where ducts pass through fire-resistant-rated construction operate upon activation of smoke detecting devices and by operation of the computer room disconnecting means for all electronic equipment, dedicated HVAC systems servicing the computer room, and uninterruptible power supplies.

Show smoke detecting device specifically associated with the operation of each rolling fire shutter and fire door. Refer to NFPA 80 1-10, 6-4.1, 6-4.2, and NFPA 101 9.6.5.2.

show emergency releasing device control panel (by others) associated with each rolling fire shutter and door that is connected to the fire alarm system. Show 120vac circuit connected to releasing device control panel in addition to power circuit required for motor operator if so equipped (additional 120vac circuit may not be required in all cases for motorized systems depending on motor horsepower and type of operator). Show wiring from fire alarm panel to releasing device control panel. Fire alarm system can only actuate closing. There is no provision available within the releasing device control panel to have the fire alarm system monitor the battery or any other trouble conditions. There is a form c contact available that could be connected to the fire alarm system showing that the releasing device control panel has operated.

Verify that the specification for the emergency releasing device control panel in section 083323 encompasses the operation specified in subparagraphs below.

Non-motorized rolling fire shutters and fire doors close when the associated smoke detecting devices are actuated. The fire alarm system initiates closure through the fire door’s emergency releasing device control panel:

There is a ten second delay before door releases.

An audible and visible warning occurs during the time delay and during closing cycle that the door is closing.

The releasing device control panel independently performs other safety and operational functions associated with fire door closing during alarm condition.

Motorized rolling fire shutters and fire doors close when the associated smoke detecting devices are actuated. The fire alarm system initiates closure through the fire door’s emergency releasing device control panel:

For doors which require mechanical resetting after release:

There is a ten second delay before door releases.

An audible and visible warning occurs during the time delay and during closing cycle that the door is closing.

Electric operator closes the door with motor power upon alarm, when power is available to the motor operator.

When power is not available to the motor operator during alarm condition, the ten second delay and warnings are initiated before door releases.

The releasing device control panel independently performs other safety and operational functions associated with fire door closing during alarm condition.

For doors that do not require mechanical setting:

Electric operator closes the door with motor power upon alarm, when power is available to the motor operator.

When power is not available to the motor operator (alarm condition or no alarm condition) the door closes by gravity as soon as power fails.

The releasing device control panel independently performs other safety and operational functions associated with fire door closing during alarm condition.

For next two subparagraphs refer to NYSUFP and BC 739.4(d)(8), 771.4(h)(10) and 1060.9.

Show smoke detecting device specifically associated with the operation of each heat and smoke roof vent. Show wiring to each heat and smoke roof vent emergency electric release device. Show wiring to each heat and smoke roof vent “open” switch.

Heat and smoke roof vents open when the associated smoke detecting devices are actuated. Visible indicators in the RA/CC’s illuminate, indicating which roof vents are open.

Check with elevator designers for details on hoistway venting. Modify subparagraph below to suit. Refer to NFPA 72 3-9.3.4 exception no. 2.

Elevator hoistway heat and smoke vents open when the associated smoke detecting devices are actuated. Visible indicators in the RA/CC’s illuminate, indicating which vents are open.

For the next several subparagraphs pertaining to elevator emergency recall operation, refer to NFPA 72 3-9.3, ANSI/ASME a17.1, and NFPA 101 7.2.12.2.4 and 9.4.3. Coordinate with Elevator Designers.

For elevator recall for fire fighters’ service, NFPA 72 3-9.3.4. States that “smoke detectors shall not be installed in elevator hoistways” (with 2 exceptions). In subparagraphs below remove the word “hoistway” unless it complies with exception no. 1 (where the top of the elevator hoistway is protected by automatic sprinklers), or exception no. 2 (where a smoke detector is installed to activate the elevator hoistway smoke relief equipment).

Phase I automatic elevator recall for fire fighter’s service operates upon actuation of an elevator lobby smoke detecting device (excluding the designated floor lobby smoke detecting device) or actuation of an associated hoistway or machine room smoke detecting device. All elevators that service that lobby return non-stop to the designated floor. (If the smoke detecting device at the designated floor is activated, the elevators that serve that level return non-stop to the alternate floor).

Each elevator lobby, hoistway and machine room smoke detecting device is capable of initiating elevator recall when all other devices on the same initiating device circuit have been manually or automatically placed in the alarm condition.

The elevator automatic (smoke detecting devices) and manual (two and three position key switches) Phase I Emergency Recall Operation and the Phase II Emergency In-Car Operation operate in accordance with the applicable ANSI/ASME A17.1 Rules 211.3 thru 211.8 and NFPA 72 3-9.3.

For each group of elevators, three separate elevator control circuits terminate at the designated elevator controller within the group’s elevator machine room.

The smoke detecting devices actuate the three elevator control circuits as follows:

The smoke detecting devices located in the designated elevator recall lobby actuates the first elevator control circuit. In addition, where the elevator is equipped with front and rear doors, the smoke detecting devices in both lobbies at the designated level actuate the first elevator control circuit.

The first control circuit prevents recalling the elevators and discharging passengers to the designated floor when the designated floor is the fire location, and to provide for an alternate recall location when the designated floor is reporting a fire condition;

The smoke detecting devices in the remaining elevator lobbies actuate the second elevator control circuit.

The second control circuit provides standard recall to the designated floor when any other elevator lobby, machine room or hoistway smoke detecting device is in alarm;

The smoke detecting devices in elevator hoistways and the elevator machine room(s) actuate the third elevator control circuit. In addition, where the elevator machine room is located at the designated level, that elevator machine room smoke detecting device also actuates the first elevator control circuit.

The third control circuit is for the safety of the fire fighters who may be using the elevators to bring equipment to staging areas. This circuit also overrides the fire fighter’s key operation and brings the elevators to a safe level of discharge prior to equipment shutdown due to fire in hoistway or machine room. The circuit also sounds a warning in the elevator cab notifying the fire fighters using the elevator to immediately move to a safe floor and exit the elevators.

Two subparagraphs below are required by NFPA 72 3.9.3.6. Omit the word “hoistway” in the next 2 subparagraphs unless it complies with NFPA 72 3-9.3.4.

Each elevator lobby, hoistway, and machine room smoke detecting device, when actuated, initiates a system alarm condition. The alarmed zone, or addressable device is visibly annunciated at the MFACP and the ICU’s associated with the elevators.

Additionally, the hoistway and machine room smoke detecting devices visibly annunciate at the MFACP and ICU’s separately and distinctly from other visible annunciation, to alert fire fighters and other emergency personnel that the elevators are no longer safe to use due to smoke and fire intrusion into the hoistways and machine rooms.

Check with Elevator Designers for details of elevator shutdown. Show design on drawings. Type of heat detecting device used must be coordinated with sprinkler heads to ensure that heat detecting device will respond before the sprinkler heads. Refer to ANSI a17.1, rule 102.2 and NFPA 72 3-9.4.

Elevator Shutdown Prior to Sprinkler Operation:

The following subparagraphs specify one method of accomplishing elevator shutdown. Other methods include (check with sprinkler designer for appropriate method): Use heat detector to shunt trip the circuit breaker. A second set of contacts in the heat detector is used to monitor the alarm. Remote addressable network modules monitor power to shunt trip circuit. Heat detector operates solenoid valve to allow water to flow into the system. This method usually operates through a control panel for monitoring, alarm and tripping functions.

Dedicated elevator shutdown ICU’s located in each elevator machine room, in conjunction with heat detecting devices located within two feet of each sprinkler head monitors the hoistways and machine rooms for heat/fire conditions.

The heat detecting device has both a lower temperature rating and a higher sensitivity as compared to the sprinkler, to ensure heat detecting device response prior to sprinkler head operation.

The elevator shutdown ICU’s and heat detecting devices are independent of the sprinkler system.

Smoke detecting devices located in each hoistway and elevator machine room monitor the hoistways and machine rooms for smoke/fire conditions. The smoke detecting devices are connected to system ICU’s. The smoke detecting devices are not connected to the elevator shutdown ICU’s. Sequence of Events:

Smoke in a machine room or hoistway during the initial stages of a fire activate the system smoke detecting devices, causing the system to perform the elevator recall functions.

As the intensity of the fire builds, the elevator shutdown heat detecting devices actuate, causing the elevator shutdown ICU to shunt trip the circuit breaker serving the main power line to affected elevators prior to the application of water. The sprinkler system operates independently after the affected elevator has shutdown.

Activation of elevator machine room or hoistway heat detecting devices are indicated by an audible alarm and a visible indicator in the MFACP.

For subparagraph below, refer to NFPA 72 3-9.4.4 and appendix a3-9.4.4. For diagram showing typical method of providing elevator power shunt trip supervisory signal.

Control circuits to shut down elevator power are monitored for presence of operating voltage. Loss of power to the control circuit for the disconnecting means causes a supervisory signal to be indicated at the ICU and MFACP. Refer to NFPA 72 A-3.9.4.4 for a typical method of providing elevator power shunt trip supervisory signal.

Subparagraph below is required under certain conditions by NFPA 101 9.4.5.

Elevator machine rooms that contain solid-state equipment for elevators automatically operates the elevator machine rooms’ independent ventilation or air conditioning system to maintain room temperature during fire fighters’ service operation.

The operating temperature must remain at or below the temperature established by the elevator equipment manufacturer’s specifications.

When elevator room operating temperature is exceeded, a supervisory signal is indicated at the MFACP.

Reference for subparagraph below is NFPA 101 9.6.5.2.

Emergency lighting energizes.

Consult with Elevator Designers regarding method to be used for elevator two-way communication. Refer to ANSI a17.1 rules 211(a)(2) and (3) and 211(b).

NFPA 101 7.2.13.8 requires communications wiring to be protected to ensure at least one hour of operation in the event of a fire.

* + - * 1. Personnel may use the elevator zoned two-way voice communication system master station (Section 142871) located at the MFACP to communicate with persons responsible for building safety.
        2. User Programmable Control-By-Event Functions:

Next several subparagraphs are examples of control-by-event functions. Edit to suit. Routine operation or monitoring portions of an HVAC system should part of a building’s direct digital control system if available.

Operation of photo cell on the building causes activation of exterior lighting on and activation of fence lighting, parking lot lighting and street lighting.

Activation of high level alarm contacts in sewage pump control panel is indicated by a supervisory signal at the MFACP and a visible indicator in the RA/CC.

The door status conditions (open, closed) are indicated by visible indicators at the MFACP. Doors located on the First Floor, Lobby, may be unlocked with commands from the MFACP.

The Computer Room (First Floor):

Air conditioning unit status is indicated by a supervisory signal and visible indicators at the MFACP.

Water alarm status is indicated by a supervisory signal and visible indicators at the MFACP.

Reference for subparagraph below is NFPA 75 6-2.2.

Electric power status to the interlock and shutdown devices is indicated by a supervisory signal and visible indicators at the MFACP.

* + - * 1. User Programmable Automatic Time-Initiated Functions (Start/Stop, On/Off, Secure/Access, etc.):

Next two subparagraphs are examples of automatic time-initiated functions. Edit to suit. Routine building operation functions should be part of a building’s direct digital control system if available.

Exterior building lighting may be energized and de-energized at times selected by facility personnel.

Parking lot lighting fixtures HPS-1 thru HPS-6 are energized from 6 p.m. to 1 a.m., Monday thru Friday.

In subparagraph below, omit reference to printing if printer is not used.

* + - * 1. An authorized person manually resets the system at the MFACP at conclusion of alarm condition. When an alarm condition is corrected, a print-out and display occurs at the MFACP stating the assigned reset message for the point in alarm with the date, time and reset suffix.

Manually resetting the system requires only one operation.

Resetting the system does not disturb system control points or functions.

* + - * 1. Primary and Secondary Power Supplies:

Failure of primary power supplies automatically transfers the affected portions of the system to the secondary power supplies:

Edit next two subparagraphs for items not required, or that cannot be energized by the secondary power supplies.

Omit reference to printing in subparagraph below if printer is not required.

Initiating, notification, print recording/printer, visible indication and supervisory functions of the system are transferred without loss to the secondary power supplies.

Ground fault indication, and battery trouble conditions, are not required to transfer to the secondary power supplies.

System power requirements are transferred to the secondary power supplies except door hold open devices, door lock releases, controls for selected HVAC equipment, fire dampers, and smoke dampers.

Audible and visible indication of alarm condition when operating system on secondary power supply is:

Omit subparagraph below for single panel project.

Performance of each ICU’s assigned audible and visible alarm functions.

Sounding of the MFACP’s audible alarm.

Illumination of the MFACP’s system alarm lamp or flashing display.

Omit reference to printing in subparagraph below if printer is not required.

Display and printing of assigned message on printer at the MFACP.

Change 24 hours to 60 hours in subparagraph below if system is connected to fire department via auxiliary or remote system. The time period of 24 (or 60) hours in subparagraph below may be reduced to 4 hours if a diesel-alternator system meets the requirements of NFPA 72 1-5.2.6(b) and 1-5.2.10.

Utilizing the secondary battery power supplies, the system operates under maximum normal load conditions for 24 hours and then is capable of operating all alarm notification appliances used for evacuation for 5 minutes.

At the end of the time period the secondary battery power supplies also have capacity to operate the rolling fire shutter, fire door and heat and smoke roof vent emergency electric release devices.

The maximum power required to operate each heat and smoke roof vent emergency electric release device is 2.5 amperes at 24Vdc for 1 minute.

Include subparagraph below if the time period of 24 (or 60) hours previously specified has been reduced to 4 hours.

The secondary supply, in addition to the battery standby power supplies, also includes connection to an automatic starting diesel-alternator system that will operate the system for 24 hours.

Upon restoration of primary power supply, the system reverts to normal operation without loss, attendant intervention, or manual re-start procedures.

* + - * 1. Monitoring Integrity of Installation Conductors and Other Signaling Channels:

Performance of Signaling Line Circuits:

Other classes and style are available other then those indicated below. Refer to NFPA 72, table 3-6. Optical fiber cables are only available style 4 or 7. Electronic cables are available for all styles.

Circuits from MFACP to ICU’s: NFPA 72, Class A, Style 7. A print-out and display occurs to identify trouble conditions.

Circuits from MFACP and ICU’s to Addressable Devices: NFPA 72, Class B, Style 4. A print-out and display occurs to identify trouble conditions.

Include subparagraph below if modem units are used.

Modem Unit Signaling Line Circuits from MFACP to ICU’s: NFPA 72, Class B, Style 1. A print-out and display occurs to identify trouble conditions.

Performance of Initiating Device Circuits:

Other classes and styles are available other than those indicated in subparagraph below. Refer to NFPA 72 table 3-5. Omit reference to sprinkler if not applicable.

Circuits from MFACP and ICU’s to Initiating Devices (Fire Alarm, Sprinkler): NFPA 72, Class B, Style C. A print-out and display occurs to identify trouble conditions.

Performance of Notification Appliance Circuits:

Other classes and styles are available other than those indicated in subparagraph below. Refer to NFPA 72 table 3-7.

Circuits from MFACP and ICU’s to Notification Appliances: NFPA 72, Class B, Style Y. A print-out and display occurs to identify trouble conditions.

Monitoring Integrity of Power Supplies:

Primary and secondary power supplies are monitored for presence of voltage at the point of connection to the system. Failure of either supply results in a system trouble condition.

Omit reference to printing in subparagraph below if printer is not required.

An audible and visible alarm, display and print-out indicates failure of the primary (main) power supplies, within the system, at the MFACP.

The system also monitors the secondary (battery) power supplies for battery trouble conditions (low voltage/no batteries, high current and charging current).

* + - * 1. Interconnection of Fire Safety Control Functions:

Subparagraphs below relate most closely with the preceding subparagraphs specifying life safety control by event functions upon alarm condition refer to NFPA 72 3-9 and NFPA 101 9.6.5.2.

Show relay or appliance and wiring thereto within three feet of the equipment that performs fire safety functions (building and fire control functions that are intended to increase the life safety for occupants or to control the spread of fire)

A listed relay or other listed appliance connected to the fire alarm system is used to initiate control of protected premises fire safety functions and is located within 3 feet of the controlled circuit or appliance.

The installation wiring between the fire alarm control unit and the relay or other appliance is monitored for integrity.

Relays and appliances that operate on loss of power are considered self-monitoring for integrity.

The method(s) of interconnection between the fire alarm system and controlled electrical and mechanical systems is monitored for integrity and is achieved by one of the following recognized means:

Electrical contacts listed for the connected load.

Listed digital data interfaces such as serial communication parts and gateways.

Other listed methods.

Fire safety functions do not interfere with other operations of the fire alarm system.

Fire safety function control devices and gateways are listed as compatible with the fire alarm control unit so as to prevent interference with control unit operation caused by controlled devices and to ensure transmission of data to operate the controlled devices.

Indicate on drawings fire safety control functions that require manual control.

Controls provided specifically for the purpose of manually overriding automatic fire safety functions provide visible indication of the status of the associated control circuits.

Status indicators for emergency equipment and fire safety functions are arranged to reflect the actual status of the associated equipment or function.

Where the fire alarm system is a component of a life safety network, and it communicates data to other systems providing life safety functions:

The path for communicating data is monitored for integrity, including the physical communication media and the ability to maintain intelligible communications.

Data received from the network does not affect the operation of the fire alarm system in any way other than to display the status of life safety network components.

Where non-fire alarm systems are interconnected to the fire alarm system using a network or other digital communication techniques; a signal (for example, heartbeat, poll, ping, query) is generated between the fire alarm system and the non-fire alarm system. Failure of proper receipt by the fire alarm system of confirmation of the transmission indicates a trouble condition.

Next several paragraphs pertain to fire protection system supervisory signal service. Refer to NFPA 72 2-6, 2-7, 2-9, 3-8.3.3, NFPA 101 9.7.2, and NYSUFP and BC 1060.4(e) and 1060.5(f)(2).

* + - * 1. Sprinkler System Alarm and Supervision:

Show sprinkler water flow alarms connected to sprinkler water flow alarm zones. Do not connect sprinkler water flow alarms on same zone with other type initiating devices. Refer to NFPA 13 3-10.2, 5-15.1.6 and NFPA 72 3-8.3.2.4.

Flow of water through a waterflow fire alarm switch causes a system alarm.

Show sprinkler control valve supervision circuits connected to sprinkler control valve supervision zones.

Supervision of sprinkler system signal attachments (sprinkler valve supervisory switches, pressure switches, etc.) are arranged to indicate circuit trouble and supervisory signal conditions at the MFACP for each circuit.

Removal of covers from water flow alarm switches indicates trouble conditions at the MFACP.

Control valves in the sprinkler system are supervised to initiate 2 separate and distinct signals at the MFACP, indicating movement of the valve from its normal position.

The off-normal signal is initiated during the first 2 revolutions of a hand wheel or during 1/5 of the travel distance of the valve control apparatus from its normal position.

The second signal indicates restoration of the valve to its normal position. (The off-normal signal remains until the valve is restored to its normal position).

* + - * 1. Supervision of Pressure Sources Associated with Fire Suppression Systems:

Pressure sources are supervised to initiate two separate and distinct signals, one indicating that the required pressure has been increased or decreased, and the other indicating restoration of the pressure to its required value.

A pressure supervisory signal initiating device for a pressurized limited water supply, such as a pressure tank, indicates both high and low pressure conditions. A signal is obtained where the required pressure is increased or decreased 10 psi from the required pressure value.

Reference for subparagraph below is NFPA 72 2-9.2(b).

A pressure supervisory signal initiating device for dry-pipe sprinkler system indicates both high and low pressure conditions. A signal is obtained when the required pressure is increased or decreased 10 psi from the required pressure value.

Reference for subparagraph below is NFPA 13 4-3.2.3.

A pressure supervisory switch for non-interlock or double interlock preaction sprinkler system initiates a signal when the pressure is not maintained at 7 psi.

A steam pressure supervisory initiating device indicates a low pressure condition. A signal is obtained where the pressure is reduced to a value that is 110 percent of the minimum operating pressure of the steam operated equipment supplied.

For paragraph below refer to NFPA 72 2-9.4.

* + - * 1. Supervision of Water Levels Associated with Fire Suppression Systems:

Water storage containers associated with fire suppression systems are supervised to obtain two separate and distinct signals, one indicating that the required water level has been lowered or raised and the other indicating restoration:

A pressure tank supervisory initiating device detects both high and low water level conditions. A signal is initiated when the water level falls 3 inches or rises 3 inches.

A supervisory signal initiating device for other than pressure tanks initiates low-water level when the level falls 12 inches.

Water storage containers are supervised to initiate 2 separate and distinctive signals, one indicating that the temperature of the water has decreased to 40 degrees F, and the other indicating restoration to a temperature above 40 degrees F.

For paragraph below refer to NFPA 20 chapter 6 and 7, and NFPA 70 695-4(b)(5).

* + - * 1. Supervision of Electric Motor Driven Centrifugal Fire Pumps:

Edit location of fire pump controller location to suit project.

Activation of contacts in the fire pump controller in Fire Pump Room are indicated by an audible signal at the MFACP and a visible indicator in the RA/CC. Separate indication for each of the following conditions:

Main power source available visible indicator (visible indicator, constantly illuminated, demonstrating that operating voltage is available to the contactor coil).

Controller connected to alternate source (controller has been transferred to the alternate source, alternate source supplying power to the controller).

Disconnecting means is open.

Loss of alarm power sources.

Controller has operated into a motor running condition (fire pump running).

Loss of line power on line side of fire pump controller, in any phase (all phases monitored).

Phase reversal on line side of fire pump controller.

Automatic transfer switch isolating switch open.

Switch at MFACP allows attendant to start fire pump for non-automatic continuous operation independent of the pressure-actuated switch. Remote station switch cannot stop the fire pump.

* + - * 1. Supervision of Diesel Engine Driven Centrifugal Fire Pumps:

Edit location of fire pump location to suit project.

Activation of contacts in the engine controller in the Fire Pump Room are indicated by an audible signal at the MFACP and a visible indicator in the RA/CC. Separate indication for each of the following conditions.

Engine running.

The controller main switch has been turned to off or manual position.

Several engine conditions are required to be monitored at the controller. Refer to NFPA 20 9-4.1.3 if it is desired to have all the conditions separately indicated at the MFACP instead of a common signal specified in paragraph below. Refer to NFPA 20 9-4.2(3).

Trouble on the controller or engine (common signal).

Switch at MFACP allows attendant to start fire pump for non-automatic continuous operation independent of the pressure-actuated switch. Remote station switch cannot stop the fire pump.

* + - * 1. Supervision of Room Temperature: A temperature supervisory device in areas exposed to freezing conditions associated with water automatic fire suppression systems indicates a decrease in water temperature to 40 degrees F and its restoration to above 40 degrees F.

Low temperature is indicated by an audible alarm at the FCS and visible indication in the RA/CC for:

For paragraph below refer to NFPA 72 2-9.5 and 3-8.3.3.1.1.

Add additional locations where temperature should be monitored.

Fire pump area.

Valve closets.

In paragraph below state the specific types of automatic fire suppression systems (carbon dioxide, halon, foam, wet chemical, dry chemical, water wash, etc.). Refer to NFPA 72 3-8.3.2.5, 3-8.3.3, 3-8.3.4.1, 3-8.4.3 and NYSUFP and BC 1060.7. Omit ICU’S for single panel project.

* + - * 1. The system operates in conjunction with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ automatic fire suppression systems (AFSS’s).

Alarm and trouble conditions in the AFSS’s are indicated at the MFACP and at the ICU’s to which the AFSS’s are connected.

A supervisory signal at the MFACP indicates off-normal condition and its restoration to normal for each AFSS (Each AFSS is separately reset at its own control panel.).

Reference for subparagraph below is NFPA 96 7-4, 7-6, 7-7. Show the shut off scheme on the drawing, and specify products to suit.

Where alarm condition is initiated by a cooking operation AFSS, all sources of fuel and electric power to the equipment associated with the AFSS are automatically shut off.

Operation of a disconnect switch which allows the system to be tested without activating the AFSS causes a trouble condition to be indicated at the FCS.

In subparagraph below indicate type of existing fire alarm sub-systems and expound interconnection details if required. Omit ICU’S for single panel project.

* + - * 1. The system operates in conjunction with existing sub-systems (fire alarm systems).

Alarm conditions in the sub-systems are indicated at the MFACP and ICU’s as individual zones.

Trouble conditions are indicated at the MFACP as a common trouble for each sub-system.

The MFACP controls existing alarm notification appliances.

For paragraph below refer to NFPA 72 3-8.3.4.1.

* + - * 1. Supervision of All Fire Suppression Systems for Tampering:

In addition to the specific supervision functions of each fire suppression system, each system also indicates trouble condition at the MFACP whenever components of the system are tampered with, opened or removed, including:

Removal of covers from junction boxes on the outside of buildings.

Valves installed in the connection between a signal attachment and the fire suppression system to which it is attached.

Operation of disconnect switches that are used to allow system testing without activating the fire suppression system.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

Omit paragraph below if existing system report is not required.

* + - * 1. Preliminary Submittal: Existing system test report.
        2. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

Company Field Advisor Letter: With the submittals package include a letter from the Company Field Advisor stating that he/she has reviewed the Submittals Package for accuracy and completeness, and approves all materials and installation methods included in the Submittals Package.

* + - * 1. Shop Drawings:

Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be acceptable).

Indicate circuits which are power-limited if power-limited wiring is proposed for use.

For 2-hour fire rated cable assemblies show proposed routes and installation details (include UL classification data, listing and system number).

Include transient surge and lightning protection grounding details for signaling line circuits, initiating device circuits, and ac power conductors entering and leaving each fire alarm control panel.

Omit subparagraph below if not required.

Interconnection details between new system and existing sub-systems.

Subparagraph below may be required for OGS projects.

Interconnection details between system and future direct Digital Building Control System.

* + - * 1. Product Data:

Catalog sheets, specifications and installation instructions.

Bill of materials.

Detailed description of system operation. Format similar to SYSTEM DESCRIPTION.

Sample procedure, programming and print-out for alarm, acknowledgment, and system reset.

Total electrical load of the complete system in supervisory and alarm conditions.

Include for each system component that utilizes batteries the battery ampere-hour capacity recommended for each component by the Company producing the system, for the specified duration.

Statement from the Company producing the system, for each size and type of single conductor and multiconductor cable proposed for use, indicating that the electrical characteristics meet the requirements of the Company.

Data from the Company furnishing the products, proving that detection devices that receive their power from the initiating device circuit or a signaling line circuit of a fire alarm control unit are UL listed for use with the control unit.

Submit copy of the control unit “Installation Manual Wiring Diagrams” that were a part of the UL “UOJZ” approval process showing that the proposed products, circuits, and wiring diagrams are UL listed “Control Units System (UOJZ)” for use with the control panel.

Submit data proving that the software and firmware is listed for use with the control panel.

Submit data proving that the initiating devices are listed for the intended application. Also for specific applications, such as:

Specific listings are required for many applications. See subparagraphs below for examples.

Smoke door release accomplished directly from the smoke detecting device, show listing for release service.

Air duct smoke detecting devices, show listing indicating complete range of air velocity, temperature and humidity expected at the device when the air handling system is operated.

Smoke detecting devices installed in supply air duct downstream of the fan and filters, show detector listed for the air velocity present.

For smoke detecting devices installed in return air system, show listing for the air velocity present where the air leaves each smoke compartment, or in the duct system before the air enters the return air system common to more than one smoke compartment.

Submit data proving that relays and appliances connected to the fire alarm system, which are used to initiate control of fire safety functions, are listed for the purpose.

Submit data proving that the method(s) of monitoring the connection between the fire alarm system and controlled electrical and mechanical systems for integrity are listed for the purpose.

Detailed description of procedure proposed to test individual initiating devices.

Include product information pertaining to the test equipment that will be used to perform the tests.

Include certified statement that the proposed test method meets the test requirements of NFPA 72 and UL 268 (cite reference to the applicable NFPA and UL paragraphs).

Name, address and telephone number of nearest fully equipped service organization.

Include list of service technicians who are NICET Level II or higher Fire Alarm Systems certified.

Include subparagraph below if modem units are used.

State grade and number of leased telephone lines required for use with modem units.

Include subparagraph below if “elevator shutdown prior to sprinkler operation” subparagraph is used in system description. Refer to NFPA 73 3-9.4.

Response time index comparison between the elevator hoistway and machine room heat detecting devices and sprinkler heads proving that the heat detecting devices will respond and will cause elevator power shutdown prior to sprinkler operation.

* + - * 1. Quality Control Submittals:

Copy of license required by New York State General Business Law Article 6-D for installing Fire Alarm Systems.

Also include copy of identification card issued by the Licensee for each person who will be performing the Work.

Company Field Advisor Data: Include:

Name, business address and telephone number of Company Field Advisor secured for the required services.

Certified statement from the Company listing the qualifications of the Company Field Advisor.

Copy of NICET Letter of Approval indicating Level III or higher Fire Alarm Systems certification.

Services and each product for which authorization is given by the Company, listed specifically for this project.

Include subparagraph below if video training programs are used.

Outline of Onsite Training Programs Required of Company Field Advisor:

Provide a separate outline of the training programs to be used to train the facility personnel, including:

System overview.

System programming.

Operation of system equipment.

System maintenance.

Estimated length (time) of each segment.

* + - * 1. Contract Closeout Submittals:

System acceptance test report.

Certificates:

Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.

NFPA Record of Completion (NFPA 72 Figure 1-6.2.1).

Operation and Maintenance Data:

Deliver 2 copies, covering the installed products, to the Director’s Representative. Include:

Operation and maintenance data for each product.

Complete point to point wiring diagrams of entire system as installed. Identify all conductors and show all terminations and splices. (Identification shall correspond to markers installed on each conductor.)

Name, address, and telephone number of nearest fully equipped service organization.

Include subparagraph below when smoke control is a function of this system (NFPA 101 7.3.1).

A suggested maintenance and testing program that will ensure operational integrity of the smoke control functions of the system.

* + - 1. QUALITY ASSURANCE
         1. Equipment Qualifications For Products Other Than Those Specified:

At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.

If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.

Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.

Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.

Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.

The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.

Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.

Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

* + - * 1. UL Listing: The system shall be listed in the UL Fire Protection Equipment Directory under product category “Control Units System (UOJZ)”.
        2. Test Facility: The Company producing the system shall have test facilities available that can demonstrate that the proposed system meets contract requirements.
        3. Company Field Advisor: Company Field Advisor shall be National Institute for Certification in Engineering Technologies (NICET) certified as Level III or higher Fire Alarm Protection/Fire Alarm Systems Engineering Technician.

Edit number of hours to suit.

Secure the services of a Company Field Advisor for a minimum of 40 working hours at the contract site for the following:

Render advice regarding installation and final adjustment of the system.

Assist in initial programming of the system.

Render advice on the suitability of each signal initiating device for its particular application.

Witness final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.

Edit number of sessions and hours to suit in subparagraph below.

Train facility personnel on the operation, programming and maintenance of the system (minimum of two 3-hour sessions).

Explain available service programs to facility supervisory personnel for their consideration.

Include paragraph below when existing sub-systems are interfaced with the new system. Adjust number of hours and modify terminology to suit.

* + - * 1. Company Field Advisor (Existing Sub-Systems): Secure the services of a Company Field Advisor from the Company of each existing sub-system for a minimum of 8 working hours at the contract site for the following:

Render advice and witness test of existing sub-systems.

Render advice on the interconnection of existing sub-systems with the new system.

Witness the final test of the combined new system and existing sub-systems.

* + - 1. MAINTENANCE
         1. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the completed Work.

Service organization personnel shall include service technicians who are National Institute for Certification in Engineering Technologies (NICET) certified as Level II or higher Fire Alarm Protection/Fire Alarm System Engineering Technician.

* + - * 1. Spare Parts:

50 percent spare of each type fuse.

30 percent spare of each type lamp (except LED type).

Modify subparagraph below if projected beam defectors are used. State the actual number of spares required, if any. Change next two subparagraphs to 20 percent for high risk areas.

10 percent spare of each type initiating device.

10 percent spare of each type notification appliance.

Omit subparagraph below if protective devices are not required.

10 percent spare of each type protective device.

Use two subparagraphs below for fanfold style printer.

Printer paper (2 cases, 3200 sheets per case for fanfold style printer).

Four ribbons for printer.

Use two subparagraphs below for strip printer.

Twelve rolls of paper for strip printer.

Four snap-in ribbon cassettes for strip printer.

Two tools to remove and install each type and size of vandal resistant fastener.

Include two subparagraphs below if a coded system is used. Change quantities to suit project requirements.

Twenty-four code locator cards (minimum size 5 x 8 inches) with the codes and location associated with each code imprinted thereon.

Twenty-four card holders for code locator cards.

1. PRODUCTS

Change article title “peer-to-peer network” to “main fire alarm control panel” for single panel project.

* + - 1. PEER-TO-PEER NETWORK

Omit paragraph below and its subparagraph for single panel project.

* + - * 1. Network: Edwards’ Systems Technology’s (Unit of GS Building Systems Corp.) EST-2, EST-3, Notifier Fire Systems Noti(Fire(Net, or Simplex Time Recorder Co. 4120:

Equip the fire alarm control panels and other network devices with network interface modules able to function with the type of wiring specified for the network communication bus signaling line circuit.

System capacities are indicated below only for reference. Do not edit panels from text. Company supplying the system must choose proper panel for each location based upon required functions and capacity.

Edwards EST-2 network 960 points, each panel 192 points; EST-3 network 160,000 points, each panel 2500 points.

Notifier: NOTI fire net/200,000 points; panels AFP 200/198 points, AFP 300/198 points, AFP 400/396 points, AFP 1010/792 points, am 2020/1980 points.

Simplex: network 50,000 points; panels 4120/4100/1000 points, 4020/508 points, 4010/254 points.

* + - * 1. Fire Alarm Control Panels: Edwards EST-2, EST-3, Notifier’s AFP-200, AFP-300, AFP-400, AFP-1010, AM2020, Simplex’s 4120, 4100, 4020, 4010:

Base selection of each fire alarm control panel upon its capacity and capabilities to the specific requirements of the system at the panels’ location.

Omit subparagraph below for single panel project.

Equip the approved fire alarm control panels to function as the MFACP and ICU’s.

Permanently record the installed software and firmware version number within each fire alarm control panel.

14 gage metal cabinet. Size as recommended by the Company producing the system.

Control switches, inaccessible behind hinged and locked door.

Alarm display and lamps visible when door is closed.

Annunciator (or display) that individually identifies addressable devices and identifies groups of non-addressable devices by zones.

Do not load visible alarm appliance circuit outputs to more than 70 percent of the FACP’s power limited rating.

Input circuits suitable for operation on 120Vac primary (main) power supply and 24 Vdc secondary (battery) power supply.

24 Vdc Secondary (Battery) Power Supplies: Sealed, lead-acid gelled electrolyte or maintenance free lead-calcium batteries:

Ampere-hour capacity to operate under load conditions specified in SYSTEM DESCRIPTION.

Battery charger with charging characteristics as recommended by battery manufacturer.

Meters for battery voltage and charging current.

Batteries and charger integrally mounted or separate cabinet mounted as recommended by the company producing the system.

Omit subparagraph below for single panel project.

Accessories as required for each FACP perform its required functions upon failure of network communications.

Transient surge and lightning protection for signaling line circuits, initiating device circuits, and ac power conductors entering and leaving each fire alarm control panel:

City Connection Circuit Wiring (reverse polarity type): UL listed to Standard 497A; Edwards’ \_\_\_\_\_\_\_\_\_\_\_, Notifier’s \_\_\_\_\_\_\_\_\_, or Simplex’s 2081-9045.

Signaling Line Circuits and Initiating Device Circuits: UL listed to Standard 497B; Edwards’ LTP, Notifier's T11325-2M, or Simplex’s 2081-9027, 2081-9028, 2081-9034, 2081-9043.

AC Power Conductors: Edwards’ TSP, Notifier’s \_\_\_\_\_\_\_\_, or Simplex’s 2081-9033, 2081-9042.

Subparagraph below is an example for a project in a large city. Modify for type of operation used by the city. Include subparagraph below only when specifically required by the local fire department. Indicate key number.

Three position key switch, keyed with fire department standard key No. \_\_\_\_\_\_\_\_ (to operate in conjunction with central station operating company procedures):

10 o’clock position - Silent test, central station operating company notified automatically. Flashing red light and audible trouble device (no silencing feature) to operate when switch is in this position.

12 o’clock position - Automatic mode (alarm), key removable only in this position.

o’clock position - Fire drills, shunts out central station operating company (to be notified by telephone). Flashing red light and audible trouble device (no silencing feature) to operate when switch is in this position.

Subparagraph below is example for small city system. Include subparagraph below only when specifically required by the local fire department.

Two position key switch, keyed with fire department standard Key No. \_\_\_\_\_\_\_\_, and trouble indicating lamp for fire department disconnect mode.

Strip printer specified below is also available separately wall mounted. Remote fanfold printers are also available.

Strip printer mounted in MFACP; Keltron VS4095/5 Two-Color Alarm Printer (Kelton Corp., 225 Crescent Street, Waltham, MA 02154 (617) 897-8710).

For OGS projects, if a direct digital control system interconnection or access to this project’s system is required from a remote IBM personal computer, obtain the applicable data from touchscreen fcs specified in part 2 of Section 283102 and add it here.

* + - * 1. Remote Auxiliary Power Supplies: Edwards’ BPS, Notifier’s FCPS-24, Simplex’s 2080 Series:

14 gage surface mounted metal cabinet. Size as recommended by the Company producing the system.

Control switches inaccessible behind hinged and locked door.

Input circuit suitable for operation on 120Vac primary (main) power supply.

Regulated and filtered 24 Vdc output.

24 Vdc Secondary (Standby) Power Supply: Sealed, lead-acid gelled electrolyte or maintenance free lead-calcium batteries:

Ampere-hour capacity to operate under load conditions specified in SYSTEM DESCRIPTION.

Battery charger with charging characteristics as recommended by battery manufacturer.

Meters for battery voltage and charging current.

Batteries and charger integrally mounted or separate cabinet mounted as recommended by the Company producing the system.

Activated by host FACP via signaling line circuit loop thru addressable modules:

Addressable control monitor activates the power supply outputs.

Addressable monitor module senses power supply trouble conditions.

Supervised power supply, battery, and notification appliance circuits.

Omit paragraph below for single panel project.

* + - * 1. Remote Addressable Network Modules (RANM):

Show remote addressable network modules in conjunction with non-addressable devices that are not available addressable when it is desirable to have them addressable for identification, monitoring and/or control functions.

Individual Addressable Module (IAM): Edwards’ SIGA-CT1, SIGA-CT2, SIGA-MM1, SIGA-WTM, SIGA-UM, Notifiers FMM-101, or Simplex’s 2190-9172, 2190-9173.

Addressable Zone Adapter Module Control and Monitor Relays (ZAM): Edwards’ SIGA-CC1, SIGA-CC2, SIGA-UM, SIGA-CR, Notifier’s FMM-1, FZM-1, FCM-1, FRM-1, or Simplex’s 2190-9163, 2190-9164, 2190-9155, 2190-9156, 2190-9173.

Include 24V dc auxiliary circuit(s) as required by RANM type to suit relay operations for control, monitoring, or supervisory functions; or interconnection of fire safety control functions.

Not all RA/CC’S need have identical functions. Specify, or show on drawings, annunciator and switch modules required in each RA/CC (usually only the RA/CC adjacent to the FACP would include annunciator modules and switch modules, other RA/CC’S would essentially function as remote annunciators). Only visible indication associated with alarm, supervisory, or trouble conditions should be in an RA/CC associated with the FACP. Visible indication specified to be on for normal operation (pump on, lights on, etc.) Should be in a separate RA/CC to reduce possibly of distraction to attendant operating the system during alarm conditions.

* + - * 1. Remote Annunciator/Control Centers (RA/CC’s): Edwards’ 2-3 ANN/D, 2-6 ANN/D, 3-ANN, Notifier’s INA/ACS, or Simplex’s Network Node Unit, with:

Edit next three subparagraphs as required for enclosure type.

Surface mounted enclosure.

Flush mounted enclosure.

Desk mounted enclosure.

LCD that is capable of displaying all system points.

Master enable/disable key switch for all control switches behind hinged and locked door having windows for visibility of system functions.

If it is desired to have visible indication for more than the one specific life safety control-by-event function specified below, add it below. Coordinate subparagraph with system description.

Annunciator modules for visible indication of specific life safety control-by-event functions:

Status of alarm notification appliances.

Coordinate subparagraph below with system description.

Annunciator modules for visible indication of specific user programmable control-by-event functions specified in SYSTEM DESCRIPTION. Identify each visible indicator with appropriate message.

If it is desired to have more than the one specific life safety control-by-event function specified below controlled by a dedicated switch, add it below. Coordinate subparagraph below with system description.

Switch modules for manual operation of specific life safety control-by-event control points:

Alarm notification appliances.

Switch modules for manual operation of each user programmable control-by-event control point that is utilized for this project.

Switch modules for manual operation of each user programmable automatic time-initiated control point that is utilized for this project.

* + - * 1. Building Manager Alarm Annunciators: Edward’s 2-3 ANND, 3-ANN, Notifer’s INA/ACS, or Simplex’s 4603, having:

Select one of next two subparagraphs.

Surface mounted enclosure.

Flush mounted enclosure.

LCD that is capable of displaying all system points.

System alarm indication (audible and visible). Silence at MFACP.

System supervision alarm indication (audible and visible). Silence at MFACP.

System trouble indication (audible and visible). Silence at MFACP.

Lamp test switch or supervised lamps.

* + - 1. INITIATING DEVICES

See information at end of section for smoke and heat sensing device application guides.

* + - * 1. General:

Fire detection devices that receive their power from the initiating device circuit or a signaling line circuit of a fire alarm control unit shall be listed for use with the control unit.

Where individually identifiable (addressable) devices are required, but not available from the Company producing the system, either:

Use non-addressable devices and individually wire each device to the FACP’s as separate monitor points, making each non-addressable device individually identifiable, or:

Employ remote addressable network modules to make each non-addressable device individually addressable.

* + - * 1. Ceiling Mounted Detecting devices (Non-Addressable, Non-Intelligent):

General:

Heat detectors, ionization type smoke detectors, and photoelectric type smoke detectors shall have common mounting base that accommodates interchanging of the different type detectors.

Smoke Detectors:

Ionization Type with LED: Edwards’ 6250B, Notifier’s 1451, or Simplex’s 2098-9576.

Use subparagraph below in locations where photoelectric type detector is required, except when the 135 degrees F rating of the thermal device may be inadequate. In such areas use second subparagraph below (without thermal device).

Photoelectric Type.

With 135 degrees F Thermal Device and LED: Edwards’ 6270B-003, Notifier’s 2451 TH, or Simplex’s 2098-9202.

With LED: Edwards’ 6270B, Notifier’s 2451, or Simplex’s 2098-9201.

Subparagraph below is required for OMH projects. (sensitivity level of 2.5 is the recommend average sensitivity).

Photoelectric type smoke detectors shall have sensitivity level of 3.2.

Remote Alarm Indicator For Use with Smoke Detectors: LED type indicator mounted on single gang stainless steel faceplate.

Heat Detectors:

Fixed Temperature:

135 degrees F: Edwards’ 293B, Notifier’s 5451, or Simplex’s 4098 Series.

190/200 degrees F: Edwards’ 294B, Notifier’s 4451 HT, or Simplex’s 4098 Series.

Combination Rate-of-Rise/Fixed Temperature:

135 degrees F: Edwards’ 291B, Notifier’s 5451 TH, or Simplex’s 4098 Series.

190/200 degrees F: Edwards’ 292B, or Simplex’s 4098 Series.

* + - * 1. Ceiling Mounted Sensors (Intelligent, Addressable, Analog):

General:

Heat sensors, ionization smoke sensors, and photoelectric smoke sensors shall have common mounting base that accommodates interchanging of the different type sensors.

Smoke Sensors:

Ionization Type: Edwards’ SIGA-IS, Notifier’s FSI-751, or Simplex’s 4098-9716/9798.

Photoelectric Type: Edwards’ SIGA-PS, Notifier’s FSP-751, or Simplex’s 4098-9714/9798.

Subparagraph below is required for OMH projects. (sensitivity level of 2.5 is the recommended average sensitivity).

Photoelectric type smoke sensor shall have initial sensitivity level of 3.2.

Multi-Sensor Type:

Multi-sensor type should be considered were early detection is required (computer rooms), or where single element detectors might be prone to false alarms.

Photoelectric/Heat: Edwards’ SIGA-PHS 3D or Notifier’s FSP-751T

Photoelectric/Ionization/Heat: Edwards’ SIGA-IPHS 4D or Notifier’s IPX-751.

Remote Alarm Indicator For Use With Smoke Sensors: Edwards’ SIGA-LED, Notifier’s RA-400, or Simplex’s 4098-9782.

Heat Sensors:

135 degrees F (fixed temperature): Edwards’ SIGA-HFS, Notifier’s FST-751, or Simplex’s 4098-9733/9789.

135 degrees F (fixed temperature/R.O.R.): Edwards’ SIGA-HRS, Notifier’s FST-751R, or Simplex’s \_\_\_\_\_\_\_\_.

* + - * 1. Air Duct Smoke Detectors (Non-Addressable):

Photoelectric duct smoke detectors are preferred. Ionization type are not recommended for air duct application.

Photoelectric Type: Edwards’ 6266B-001, Notifier’s DH400P, or Simplex’s 2098-9649/9201.

Listed for the air velocity present at each air duct detector’s location.

Sampling tube to suit installation.

Local relay (for fire safety control functions from duct detector when applicable):

Form C contacts(s) rated minimum 1A @ 28Vdc power-limited, 1/2A @ 120Vac nonpower-limited.

24Vdc auxiliary power circuit(s) as required to suit relay operation and function.

Show location of remote alarm indicators and test stations for smoke detectors, if used.

Remote Alarm Indicator For Use With Air Duct Smoke Detectors: LED type indicator mounted on single gang stainless steel faceplate.

Subparagraph below is required for OMH projects.

Remote Alarm Indicator And Test Switch For Use With Air Duct Smoke Detectors: LED type indicator and key operated switch mounted on single gang stainless steel faceplate.

* + - * 1. Air Duct Smoke Sensors (Intelligent, Addressable, Analog):

Photoelectric duct smoke sensors are preferred. If ionization type are considered, consult with manufacturer’s representative for catalog number and proper application.

Photoelectric Type: Edwards’ SIGA-PS w/SIGA-DH, Notifier’s FSD-751P, or Simplex’s 4098-9752/3 with 4098-9714.

Listed for the air velocity present at each air duct smoke sensor’s location.

Sampling tube to suit installation.

Local relay (for fire safety control functions from duct detector when applicable):

Relay operation programmable from FACP.

Form C contact(s) rated minimum 1A @ 28Vdc power-limited, 1/2A @ 120Vac nonpower-limited.

24Vdc auxiliary power circuit(s) as required to suit relay operation and function.

Show location of remote alarm indicators and test stations for smoke sensors, if used.

Remote Alarm Indicator For Use With Air Duct Smoke Sensors: LED type indicator mounted on single gang stainless steel faceplate.

Subparagraph below is required for OMH projects.

Remote Alarm Indicator And Test Switch For Use With Air Duct Smoke Sensors: LED type indicator and key operated switch mounted on single gang stainless steel faceplate.

Specify flame detecting devices under paragraph below, if required. Several types of specialized flame detecting devices are available. Consult manufacturer’s catalogs.

Use flame detecting devices in areas where ignition is almost instantaneous (flammable liquids, combustible gases, etc.) Refer to NFPA 72 2-4.

* + - * 1. Flame Detecting Devices (Non-Addressable):

Explosion proof detectors also available 190 degrees F R.O.R./F.T. and 135 degrees or 190 degrees F fixed temperature. Suitable for class 1 group D; class II group E, F, G. Also available moisture proofed.

* + - * 1. Explosion Proof Rate-of-Rise/Fixed Temperature Heat Detectors (Non-Addressable):

135 degrees F: Edwards’ EPB501, Notifier’s 302-EPM-135, or Simplex’s 2098-9430.

Projected beam detectors may be suitable for use in a building with a high ceiling and large space where it is not practical to install numerous spot type smoke detecting devices. Refer to NFPA 72 2-3.6.3.

* + - * 1. Projected Beam Type Detectors (Non-Addressable): Edwards’ 6424, Notifier’s 6424, or Simplex’s 2098 Series.
        2. Manual Fire Alarm Boxes:

Non-Addressable:

Single Action Pull Type: Edwards’ 276B Series, Notifier’s BNG-1R, or Simplex’s 2099-9754 Series.

Addressable:

Single Action Pull Type: Edwards’ SIGA-270, Notifier’s, NBG-12LX, or Simplex’s 2099-9795.

* + - 1. NOTIFICATION APPLIANCES
         1. General:

Provide UL 464 listed audible signal appliances:

Classified “Public” or “Private Mode Only” to suit application.

Marked “F. A. Service” or “F. A. Service - Private Mode Only” to suit application.

Provide UL listed visible signal devices:

For private mode applications, UL 1638 “Fire Protective Visible Signaling Appliance”.

For public mode applications, UL 1971 “Signaling Devices for the Hearing Impaired”.

For wall mounting or ceiling mounting to suit application.

15 Candela visible appliances may not currently (03/01) meet ADA/ADAAG requirements (www.access-board.gov) until a pending revision is approved. The revised ADA and other codes and standards pertaining to visible requirements will basically be aligned with NFPA 72.

In lieu of separate appliance, use paragraph below as the preferred appliance when a wall mounted combination audible/visible appliance can meet all audible and visible design requirements.

* + - * 1. Combination Audible/Visible Appliances - Wall Mounted:

Use type av for general wall mounted use in dry locations.

Type AV: Edwards’ Genesis Series, Notifier’s SpectrAlert Series, or Simplex’s TrueAlert Series:

Show separate visible alarm circuit and audible alarm circuit to combination appliances.

Xenon flashtube strobe:

AV-15: 15 candela.

AV-75: 75 candela.

AV-110: 110 candela.

Clear lens having FIRE imprinted thereon in red letters, or clear lens with red base having FIRE imprinted thereon in white letters.

Audible alarm notification appliance as indicated on the drawing.

Horn output ranges approximately from 80 DBA 10 feet to (reverberant chamber-UL 464 test) to 94 DBA at 10 feet (anechoic chamber) and also varies depending on coded or steady signal.

Horn.

Speaker.

Bell.

Chime (Electro/Mechanical).

Chime (Electronic).

Surface or flush wall mounted as indicated on the Drawings.

* + - * 1. Visible Appliances - Wall Mounted:

Type v visible appliance is suitable for general wall mounted use in dry locations.

Type V: Edwards’ Genesis Series, Notifier’s SpectrAlert Series, or Simplex’s TrueAlert Series:

Xenon flashtube strobe:

V-15: 15 candela.

V-75: 75 candela.

V110: 110 candela.

Clear lens having FIRE imprinted thereon in red letters, or clear lens with red base having FIRE imprinted thereon in white letters.

Surface or flush wall mounted as indicated on the Drawings.

* + - * 1. Audible Appliances - Wall Mounted:

Horns:

Use type H for general wall mounted use in dry locations.

Type H: Edwards’ Genesis Series, Notifier’s SpectrAlert Series, or Simplex’s TrueAlert Series:

Horn output ranges approximately from 80 DBA at 10 feet (reverberant chamber UL 464 test) to 94 DBA at 10 feet (anechoic chamber) and also varies depending on coded or steady signal.

Surface or flush wall mounted as indicated on the Drawings.

Type H-1 trumpet type suitable for damp or wet locations, or high ambient noise applications.

Type H-1: Edward’s 5530D-AW Adaptatone, Notifier’s \_\_\_\_\_\_\_\_, or Simplex’s 4901-9813:

Surface wall mounted.

Sound output ranges from 103 to 110 DBA at 10 feet, depending on tone.

Selectable multiple tone signals.

Suitable for damp and wet locations.

Vibrating Bells:

Type VB: Edwards’ 439D-110AW, Notifier’s KMS or Wheelock MB Series, or Simplex’s 2901 Series Bells:

Bells are rated (approximately) 92 DBA at 10 feet.

Ten inch bells.

Surface or flush wall mounted as indicated on the Drawings.

Weatherproof bell kits where installed in damp or wet locations.

Chimes:

Electro/mechanical chime is rated (approximately) 75 DBA at 10 feet (private mode).

Type M (Electro/Mechanical): Edwards’ 329D-AW, Notifier’s \_\_\_\_\_\_\_\_, or Simplex’s S2902 Series.

Surface wall mounted.

Electronic chime is rated up to 90 DBA at 10 feet at maximum volume.

Type E (Electronic): Edwards’ Integrity 757 Series, Notifier’s Wheelock CH Series, or Simplex’s Wheelock CH Series.

Adjustable volume control

Surface or flush wall mounted as indicated on the Drawings.

* + - 1. MASTER TRANSMITTER FOR MUNICIPAL CONNECTION

Check with operators of the municipal system or remote station to which tie-in is required. Each system requires specific equipment and procedures. Paragraph below is an example for a large city system.

* + - * 1. The Office of General Services will secure an agreement with a central station operating company. Contractor shall:

Install transmitters furnished by the central station operating company.

Provide conduit and wiring between transmitters and MFACP.

Provide relays and equipment in MFACP as required to operate in conjunction with central station operating company system.

Paragraph below is an example for small city system. Modify as required for actual fire department name, type of equipment required, and contact persons name, address and telephone number.

* + - * 1. Comply with \_\_\_\_\_\_\_ Fire Department requirements:

Master Fire Alarm Box: Gamewell Corp.’s Three Fold Master Fire Alarm Box Data Sheet 3130, shunt type, flush mounted, wheel code #22.

Contact:

If digital alarm communicator system is the method used for alarm transmission to a central supervising station, refer to NFPA 72 5-5.3.2. Two separate means of communication are required (NFPA 72 5-5.3.2.1.6 and 7). The DACT’S furnished by the specified companies employ the use of two telephone lines.

* + - 1. DIGITAL ALARM COMMUNICATOR SYSTEMS
         1. Digital Alarm Communicator Transmitter (DACT): Edwards’ FACP module, Notifier’s FACP module, or Simplex’s Model 2080-9024:

Input circuit suitable for operation on 24 Vdc primary and secondary power supplies.

DACT may be separately wall mounted or an integral module in a fire alarm control panel.

UL-864 listing.

NFPA 72 compliance, operation with two telephone lines.

Compatible with central supervising station DACR and regulations.

* + - * 1. Digital Alarm Communicator Receiver (DACR).

Subparagraph below specifies an example of a DACR. Modify to suit. Add central supervising location address.

The central supervising station DACR is an Ademco Model 685, located at \_\_\_\_\_\_\_\_.

The contact person is \_\_\_\_\_\_\_\_.

* + - 1. MODEM UNITS

These modems are used for long distance communication over leased telephone lines to interface remote system equipment (fire alarm panels, CRT/keyboards, printer, annunciators).

* + - * 1. Modems: Edwards’ SHM-M/SHM-F, Notifier’s TP1-232, or Simplex’s 4100-0131 FSK Series:

Input circuit suitable for operation on 120 V ac primary (main) power supply and 24 V dc secondary (standby) power supply.

Full duplex operation requires two pairs of leased lines. Half duplex operation is available for receive only devices. Arrangements for the proper grade of leased lines must be made by the facility. Notify the client agency during design that leased lines are required.

Full duplex operation.

UL-864 listing.

In subparagraph below, dial-up operation is also available for use with dial-up pair telephone lines.

Dedicated leased line operation.

RS232C to DC converter.

DC to RS232C converter.

Select one of next two subparagraphs.

Surface mounted cabinets, housing components of each unit.

Recessed mounted cabinets, housing components of each unit.

* + - 1. ELECTROMAGNETIC DOOR HOLD-OPEN RELEASE DEVICES

Coordinate with hardware group. Construction may include specified devices in paragraph below or other types in their contract.

* + - * 1. Electromagnetic Door Hold-Open Devices: Edwards’ 1500 Series, Notifier’s FM Series, or Simplex’s 2088 Series, having:

Door hold-open devices shall be monitored for integrity (NFPA 72 3-9.6.3). NFPA 72 3-9.2.1 exception allows relays or appliances that operate on loss of power to be considered self-monitoring for integrity.

When using 120vac, show local 120vac circuits controlled by relays connected to the ICU’S.

When using 24vdc, verify that ICU power supply can accommodate the required number of door hold open devices. Modify subparagraph below to suit.

Input circuit suitable for operation on 120Vac.

Listed relay for control of 120Vac door hold-open release devices suitable for operation on 24Vdc. Relay operates on loss of power to release door (self-monitoring for integrity).

Show where electromagnetic door hold-open devices are required and type of mounting (single door, double door, wall, type of armature/contact plate). Avoid floor mounting (hard to clean around and people trip over them).

Style (single door, double door, wall, type of armature/contact plate) suitable for the application.

Wall style designed for surface or flush mounting as indicated on the drawings.

* + - 1. AUTOMATIC FIRE SUPPRESSION SYSTEM SIGNAL ATTACHMENTS

Coordinate with plumbing. Plumbing may include the specified attachments or other types in their contract.

* + - * 1. General:

Use non-addressable devices and individually wire each device to the FACP’s as separate monitor points, making each non-addressable device individually identifiable, or:

Employ remote addressable network modules to make each non-addressable device individually addressable.

* + - * 1. Sprinkler Valve Supervisory Switches:

For Outside Screw and Yoke Gate Valves: Grinnell’s Model F640, Notifier’s OSY2, Potter Electric Signal Co.’s OSYSU Series, or Simplex’s 2097 Series.

For Post Indicator Valves: Potter Electric Signal Co.’s PCVS Series, Notifier’s P1BV2, or Simplex’s 2097 Series.

For Gate Valves (Non-Rising Stem) and Special Applications: Potter Electric Signal Co.’s PTS, Notifier’s \_\_\_\_\_\_\_\_, or Simplex’s 2097 Series.

Other type signal attachments are available for air pressure, water level, and temperature.

* + - * 1. Tamper Switches: By Micro Switch or Square D Company to suit installation conditions.
        2. Waterflow Switch, Vane Type: Autocall Div., Federal Signal Corp.’s 4160, Notifier’s WFD Series, Potter Electric Signal Co.’s VSR, Reliable’s Model A, or Simplex’s 2097 Series having:

Corrosion-resistant vane.

Splash/dust resistant enclosure with anti-tamper switch.

Adjustable pneumatic retard.

Screw type wiring terminals.

Switch rated minimum 7.0 amps at 125 Vac and 0.25 amps at 125 Vdc.

* + - 1. PROTECTIVE DEVICES

Refer to NFPA 72 2-1.3.1 for initiating device protection requirement and 4-2.3 for notification appliance protection requirements.

Show pull stations equipped with protective shields in areas subject to vandalism and prank alarms.

* + - * 1. Pull Station Protective Shield: Clear Lexan shield and red frame covering manual pull station. When shield is lifted a battery powered warning horn is activated. The horn is silenced by lowering and realigning the shield.

Edwards’ STI Series Stopper II, Notifier’s STI Stopper II, Safety Technology International Inc.’s STI Stopper II, or Simplex’s 2099 Series (STI) including:

Batteries.

Weatherproof shield for damp and wet locations.

Mounting accessories.

Show bells equipped with protective grid where subject to significant impact or vandalism.

* + - * 1. Protective Grid for Bells: Edwards’ Full Cast Grid, Notifier’s \_\_\_\_\_\_\_\_, or Simplex’s \_\_\_\_\_\_\_\_.

Show initiating devices and notification appliances equipped with steel web guards in locations where subject to moderate impact or physical abuse.

* + - * 1. Steel Web Guards.

For Smoke and Heat Detection Devices: Edwards’ 1206B, Notifier’s STI Steel Web Stoppers, Safety Technology International Inc.’s STI Steel Web Stoppers, or Simplex’s 2098 Series.

Steel Web Guards for General Application (Horns, Strobes, Beam Detectors, Speakers, Bells, etc.):

Other gages and finishes are available.

Construction:

All welded 7 gage wire.

Nickel plated finish with lacquer coating.

Manufacturer: Chase Security Systems, Inc. 5947 North Milwaukee Avenue, Chicago, IL 60646, Telephone (773) 775-7148, FAX (773) 594-0078.

* + - 1. TERMINAL STRIP CABINETS
         1. Lockable, vandal resistant, surface mounted cabinets constructed of 14 gage steel, size as recommended by the Company producing the system. Equip cabinets with barrier type double screw terminals rated 300 V minimum, meeting UL 94 requirements for materials classed 94 V-0. Use identification strips, tags or labels to identify each conductor. Paint cabinets fire department red and stencil on front in 1/2 inch high white letters, the purpose of each terminal strip cabinet.
      2. POWER-LIMITED FIRE ALARM CIRCUIT CONDUCTORS
         1. All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation etc.).
         2. Multiconductor Cables NFPA 70 type FPLP, FPLR, FPL:

Insulated copper conductors.

Conductors twisted, shielded and jacketed as recommended by the Company producing the system.

Voltage rating of not less than 300 volts (Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings).

* + - * 1. Other types of cables may be used in accordance with NFPA 70 Table 760-61 “Cable Uses and Permitted Substitutions”, as approved, if listed as being suitable for the purpose.
      1. NONPOWER-LIMITED FIRE ALARM CIRCUIT CONDUCTORS
         1. All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation, etc.).
         2. Conductors twisted, shielded and jacketed as recommended by the Company producing the system.
         3. Single Conductors:

No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, N.E.C. types KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, ZFF.

Larger Than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with NFPA 70 Article 310.

Conductors with other types and thickness of insulation may be used if listed for nonpower-limited fire alarm circuit use.

* + - * 1. Multiconductor Cables NFPA 70 Types NPLFP, NPLFR, NPLF:

Conductors:

Conductor Sizes No. 18 and No. 16 AWG: Insulated copper conductors rated 600 volts, NFPA 70 types KF-2, KFF-2, PAFF, PTFF, PF, PFF, PGF, PGFF, RFH-2, RFHH-2, RFHH-3, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, ZFF.

No. 14 AWG and Larger: Insulated copper conductors suitable for 600 volts, one of the types listed in NFPA 70 Table 310-13 or one that is identified for nonpower-limited fire alarm circuit use.

Cable Listing and Marking: NPLFP, NPLFR, and NPLF marked to suit listings and may be marked with a maximum usage voltage rating of 150 volts.

* + - 1. MC CABLE
         1. Metal-Clad Cable, NFPA 70 Type MC:

All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation, etc.).

Conductors twisted, shielded and jacketed as recommended by the Company producing the system.

Interlocked flexible galvanized steel armor sheath conforming to UL requirements for Type MC metal clad cable.

Insulated copper conductors suitable for 600 volts:

No. 18 and No. 16 AWG: A type listed in NFPA 70 Table 402-3 with a maximum operating temperature not less than 90°C, or types KF-2, KFF-2, PAF, PAFF, PTFF, PF, PFF, PGF, PGFF, PTF, PTFF, SF-2, SFF-2, ZF, ZFF.

No. 14 AWG and Larger: One of the types listed in NFPA 70 Table 310-13 or of a type identified for use in Type MC cable.

Acceptable Companies: AFC Cable System, Inc., Coleman Cable Co.

Connectors for MC cable: AFC Fitting Inc.’s AFC Series, Arlington Industries Inc.’s Saddle Grip, or Thomas and Betts Co.’s Tite-Bite with anti-short Bushings.

* + - 1. 2-HOUR FIRE RATED CABLE ASSEMBLIES
         1. Fire Alarm Circuit Integrity (CI) Cable: Cables identified as meeting the requirements for circuit integrity shall have the additional classification using the suffix “CI”. Examples: FPLP-CI, FPLR-CI, FPL-CI, NPLFP-CI, NPLFR-CI, NPLP-CI.

Cables shall have a minimum 2-hour fire resistance rating for the cable when tested in accordance with the Standard for Tests of Fire Resistive Cables-UL 2196.

* + - * 1. MI Cable: AFC Cable Systems’ MI cable, or BICC/Pyrotenax Mineral Insulated System 1850 Pyrotenax Cable:

MI cable is available in several configurations and materials. Consult manufacturer’s catalogs. Also available no. 16 AWG.

All electrical characteristics shall meet the requirements of the Company producing the system (conductor to conductor capacitance, dc resistance, velocity of propagation, etc.).

Solid copper conductors, twisted, shielded as recommended by the Company producing the system.

System 1850 copper is rated to 1850 degrees F and is suitable for general use. Stainless steel systems are available, rated 2000 and 2200 degrees F, and are suited to some applications where corrosion or chemicals may be deleterious to copper sheath.

Seamless copper sheath.

Two hour fire resistive rating UL system classified, listed in the UL Fire Resistance Directory product category Electrical Circuit Protective Systems (FHIT) and Fire Resistive Cables (FHJR).

Include subparagraph below when increased corrosion protection is required due to environmental conditions.

PVC or HDPE jacketing (where shown on drawings).

Accessories as required for a complete system to suit installation conditions.

* + - * 1. Other 2-hour Fire Resistive Cables: Listed in UL Buildings Materials Directory, product category Electrical Circuit Protective Systems (FHIT), and Fire Resistive Cables (FHJR):

Type MC/CI: Rockbestos – Surprenant Cable Corp.’s VITALink MC Circuit Integrity Cable (FHIT System No. 17).

PVC jacketing (where shown on drawings).

Type FPL/EMT: Rockbestos – Surprenant Cable Corp.’s VITALink FA UL Listed Type FPL installed within ¾” EMT steel conduit (FHIT System No. 22).

* + - 1. SIGNS, LABELS, MARKERS, AND NAMEPLATES
         1. Procedure Sign: Card holder with aluminum or stainless steel frame, plexiglass front and sheet aluminum card backing plate. Minimum size card 8 x 10 inches. For each procedure sign furnish l blank card in holder and 5 spare blank cards suitable for typing future procedures thereon.

Include paragraph below if a coded system is used.

* + - * 1. Code Locator: Card holder with aluminum or stainless steel frame, plexiglass front and sheet aluminum card backing plate. Minimum size card 8 x 10 inches. Type all codes on the card and the area associated with each coded alarm signal.

Omit paragraph below if RACC is not used.

* + - * 1. Alarm Notification Locator: Card holder with aluminum or stainless steel frame, plexiglass front and sheet aluminum card backing plate. Minimum size card 8 x 10 inches. Type on card the switch numbers and location of notification appliances controlled by each switch.

Assess need for floor locator and edit paragraph below to suit project.

* + - * 1. Floor Locator: Flip type bound file, indexed with tabs and equipped with 8-l/2 x 11 inch (minimum) plan of each floor in building. Show location of all major equipment associated with the system. Also show location of each manual fire alarm box. Enclose each floor plan in clear plastic envelope so that floor plans can be removed and updated.
        2. Wiring Diagram: One line diagram showing interconnection of all major components associated with the system. Encase with aluminum or stainless steel frame, and plexiglass front.
        3. Nameplates: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.

Phenolic: Two color laminated engraver’s stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).

Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

* + - * 1. Fire Alarm Signs: 9 x 12 inches, metal, with the words “FIRE ALARM” imprinted thereon in white letters upon a red background. Include a white arrow pointing down, left or right showing the route to, or actual location of the fire alarm stations. Frame the outside edges of the signs in red and white diagonal stripes.

Sign Mounting Styles:

Single face for mounting flat against the wall.

Double faced for mounting extended from wall.

* + - * 1. Manual Fire Alarm Box Signs: Precision engrave letters with uniform margins, character size minimum 1/8 inch high, stating “LOCAL ALARM ONLY - NOT CONNECTED TO FIRE DEPARTMENT-CALL FIRE DEPARTMENT BY TELEPHONE”.

Phenolic: Two color (red surface, white core) laminated engraver’s stock, 1/16 inch minimum thickness, machine engraved to expose inner core color.

* + - * 1. Markers:

Premarked self-adhesive; W.H. Brady Co.’s B292, B708, Ideal Industries’ Mylar/Cloth wire markers, or Markwick Corp.’s permanent wire markers, Plastic Extruded Parts Inc.’s Flexible Sleeve or ID Band Markers, or Thomas and Betts Co.’s E-Z Code WSL self-laminating.

Other Styles: To suit application by W.H. Brady Co., Ideal Industries, Marwick Corp., Plastic Extruded Parts, Inc., or Thomas and Betts Co.

* + - 1. SYSTEM KEYING
         1. All system locks, key switches, etc., shall operate with the same key.
      2. ACCESSORIES
         1. Include accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.
      3. FIRE EXTINGUISHER
         1. CO2 type fire extinguisher, minimum 20 pound unit by Amerex Corp., Ansul Inc., Fire-End and Croker Corp., or Walter Kidde Portable Equipment, Inc.

1. EXECUTION
   * + 1. VERIFICATION OF CONDITIONS
          1. Testing Existing Sub-Systems:

Indicate which sub-systems are to be tested.

Prior to installing the new system, test the existing sub-systems (\_\_\_\_\_\_) to ascertain their operating condition:

Individually test initiating devices (except non-restorable types).

Test each initiating device circuit.

Test notification appliances.

Test each notification appliance circuit.

Test all control panel functions.

Do not discharge fire suppression systems.

Test shall be witnessed by the Company Field Advisor and the Director’s Representative.

Include subparagraph below when specifically requested by client agency (most applicable to O.G.S. projects).

Conduct tests that are disruptive to facility personnel after normal working hours as directed.

Prepare a written report for the Director’s Representative indicating the repairs required, if any, to make the existing sub-systems function properly.

Repairs to the existing sub-systems are not included in the Work unless requested by Order on Contract.

* + - 1. INTERRUPTIONS TO EXISTING SUB-SYSTEMS
         1. Maintain the existing sub-systems in their present condition to the extent possible while installing new Work.

Use paragraph below for standard procedure. Use second paragraph below when specifically requested by client agency (most applicable to O.G.S. projects). Second paragraph below may also be applicable for extensive rehab projects where the existing F.A.S. may be out of service for extended periods due to requirements of protecting smoke detecting devices from airborne dust and debris (required by section 015000). Refer to NFPA 101 9.6.1.8.

* + - * 1. Prior to making changes or removals relative to the existing sub-systems, notify the Director’s Representative and have procedures approved.
        2. When changes or removals are required to the existing fire alarm system such that it’s ability to act as a fire alarm system is impaired, provide a temporary fire alarm system so that the building is protected at all times by a functioning fire alarm system. Notify Building Supervisor (thru Director’s Representative) of proposed temporary measures and scheduling. Both the proposed temporary measures and the scheduling must be approved by the Director’s Representative.
        3. Provide signs, instructions and alternate methods for reporting a fire.
      1. INSTALLATION

Show a one line diagram of complete system including initiating device circuits, notification appliance circuits, and signaling line circuits, but do not show number or size of wires (see information at end of section 260532 indicating alternate methods for showing the risers on the drawings). Do not show any 120 VAC wiring (such as door hold open devices) run in the same raceway with 24VDC circuits.

* + - * 1. Install system in accordance with the Company’s printed instructions unless otherwise indicated.
        2. Do not install smoke detecting devices until the Work (including cleaning) of all trades in the area has been completed. Protect installed smoke detecting devices from airborne dust and debris.
        3. Mount smoke detecting devices, and seal air holes in the back of the devices (including interior of raceways and holes associated with installation of boxes and raceways) so that air flow from inside of housing or from the periphery of the housing will not prevent entry of smoke during a fire or test condition. Seal air holes with gaskets, expanding silicone foam, or other sealants as approved.

Coordinate paragraph below with Elevator Designers.

* + - * 1. Wiring for Elevator Recall for Fire Fighter’s Service and Other Elevator Emergency Functions:

Show wiring from MFACP and ICU’S to terminal strip cabinet in elevator machine room for all elevator emergency operations.

Provide wiring to and including a terminal strip cabinet in elevator machine rooms.

Contractor responsible for elevator installation will provide elevator control equipment for elevator operation and final electrical connections between terminal strip cabinet and the elevator controllers.

* + - * 1. Wiring For Survivability:

Signals from manual fire alarm boxes and other fire alarm initiating devices within a building transmitted over the same signaling line circuit shall not interfere with the manual fire alarm box signals when both types of initiating devices are operated at the same time.

Failure of equipment or a fault on one or more installation wiring conductors of one notification appliance circuit shall not result in functional loss of any other notification appliance circuit.

In subparagraph below omit ICU’S from single panel project.

Connect MFACP, ICU’s and other system components requiring a primary power supply to dedicated branch circuits.

Do not connect MFACP and ICU’s to a 2 pole device that can trip both poles at once, such as a 2 pole circuit breaker with handle tie (omit the tie).

Splices in wiring in vertical risers is prohibited.

Avoid splices in horizontal runs. When splices are necessary, use junction boxes. Exception: For 2-hour fire rated cable assembly, use UL listed methods to maintain 2-hour rating.

Make splices with mechanical or hydraulic type pressure connectors. The use of wire nuts is prohibited.

Paint cover of junction boxes fire department red.

For subparagraph below refer to NFPA 72 3-8.4.1.1.4.

Protect notification appliance circuits and other circuits necessary for the operation of the notification appliance circuits from the point at which they exit the fire alarm panel until the point that they enter the notification zone that they serve using one or more of the following methods:

A 2-hour rated cable assembly.

If a 2-hour rated shaft, enclosure or stairwell is a viable method, identify the 2-hour rated area on the drawings and show wiring routed therein. If 2-hour rated areas are not available, omit 2 subparagraphs below, and identify wiring on drawing as 2-hour fire rated cable assembly.

A 2-hour rated shaft or enclosure.

A 2-hour rated stairwell in a building fully sprinklered.

Subparagraph below is required by NFPA 72 3-4.2.2.2 for class a circuits. Edit for styles used for project. Omit ICU’S for single panel project. If class A, style 6, 7, D, E, or Z circuits are used, show the raceway system looped back to the MFACP or ICU’s. Do not show both legs of wiring loop returned to MFACP or ICU’S in the same raceway or along same route. Show separate raceway or 2-hour fire rated cable assembly.

Wiring Class A, Style 6, 7, D, E, or Z Signaling Line Circuits, Initiating Device Circuits and Notification Appliance Circuits: Do not install both legs of Class A, Style 6, 7, D, E, or Z circuits in same cable assembly, enclosure, or raceway back to MFACP or ICU’s.

Run return legs along another route to obtain maximum benefit of these alternate path circuits.

* + - * 1. Identification, Labeling, Marking:

Extensive additional signage for floor evacuation procedures during a fire emergency and instructions for use of elevators and exits is required by NYSUFP and BC 735.1(n) and 765.1(n) for buildings equipped with elevators. Coordinate signage with construction contract, section 101423. If no construction contract, include section 101423 under this contract.

Omit reference to remote annunciator in next two subparagraphs if not used.

Procedure Sign: Install adjacent to MFACP and remote annunciator.

Include subparagraph below. If a coded system is used.

Code Locator: Install adjacent to MFACP and remote annunciator.

Omit subparagraph below if RA/CC is not used.

Alarm Notification Appliance Locator: Install adjacent to each RA/CC.

Floor Locator:

Install adjacent to MFACP.

Omit subparagraph below if only one FACP is used.

Install adjacent to each ICU (show area protected by ICU).

Edit subparagraphs below to suit project.

Nameplates:

Install on each manual fire alarm box a nameplate stating: Floor number, and location (1st Fl, east, etc.).

Omit subparagraph below if RA/CC is not used.

Install adjacent to each RA/CC annunciator module and switch module a nameplate indicating function of module.

Show all equipment requiring a primary power supply connected to branch circuits supplied by a diesel-alternator system when available.

Label the device used as the circuit disconnecting means for the dedicated branch circuits serving the system “FIRE ALARM CIRCUIT CONTROL” with white letters on a red background.

In subparagraph below omit ICU’S for single panel project.

Install on each system component requiring a primary power supply a label stating the location of its circuit disconnecting means.

Install nameplate on each remote alarm indicator stating the location of its smoke detecting device and the area protected by the smoke detecting device and its function (IN DUCT SMOKE DETECTOR ALARM FOR \_\_\_\_\_\_\_\_).

Power-Limited Circuits: Mark circuits at terminations, indicating that circuit is a power-limited fire protective signaling circuit.

Indicate number of signs in subparagraph below. To suit job conditions. The signs are required by NYSUFP and BC 1060.2(b)(6).

Fire Alarm Signs: Where directed, install \_\_\_\_\_\_\_\_ single face signs mounted flat against the wall and \_\_\_\_\_\_\_\_ double faced signs mounted extended from the wall at conspicuous locations, drawing attention to the manual fire alarm boxes. Fasten signs to walls with vandal resistant fasteners.

Manual fire alarm box signs in subparagraph below are required by the NYS UFP and BC 1163.13(c)(4) if system is not directly connected to a central station alarm service, municipal alarm system or local manned fire alarm dispatch station.

Identification of Manual Stations Which Do Not Transmit Alarm to Fire Department: Install manual fire alarm box sign above each manual fire alarm box.

Identification of Circuits: Identify wires and cables by system and function in interconnection cabinets, and FACP’s to which they connect with premarked, self-adhesive, wraparound type markers. Designations shall correspond with point to point wiring diagrams.

Battery Data: Insert a copy of the battery warranty in each battery compartment and mark on batteries the date placed in service.

Alarm Verification Warning Marking: Affix to the inside of each FACP, a list indicating:

Affected circuits.

Delay (seconds).

The smoke detector model numbers used.

* + - * 1. Fire Suppression Systems Signal Attachments:

Show tamper switches and connection to all tamper switches. Refer to system description for required tamper switch applications.

Install tamper switches.

Coordinate subparagraph below with plumbing. Plumbing may include the installation of attachments in their contract. Also coordinate installation of attachments for each fire suppression system.

Install sprinkler system signal attachments.

* + - * 1. Protective Devices: Install where indicated on the drawings.

Where devices are installed on wood or masonry surfaces, attach protective devices directly to the surface with vandal resistant fasteners.

Where devices are installed on suspended ceiling provide additional supports in the ceiling, such as channel support system, angle iron or additional runner bars. Fasten the additional supports rigidly to the ceiling runner bar system. Attach frame or brackets of protective device to the supports with vandal resistant fasteners. Install metal spacers between the protective device frame and the supports so that the ceiling tiles will not be a part of the support system.

Use finishing collar between surface and protective device where protective device cannot be mounted tight against surface due to job conditions.

* + - * 1. Locate fire extinguisher proximate to MFACP.
      1. FIELD QUALITY CONTROL
         1. Preliminary System Test:

Preparation: Have the Company Field Advisor adjust the completed system and then operate it long enough to assure that it is performing properly.

Run a preliminary test for the purpose of:

Determining whether the system is in a suitable condition to conduct an acceptance test.

Checking and adjusting equipment.

Training facility personnel.

* + - * 1. System Acceptance Test:

Preparation: Notify the Director’s Representative at least 3 working days prior to the test so arrangements can be made to have a Facility Representative witness the test.

Supply all equipment necessary for system adjustment and testing.

Make the following tests:

Test the system in accordance with NFPA 72, Chapter 7.

Follow test methods stated in Table 7-2.2.

Record results on NFPA 72 Figure 1-6.2.1 Record of Completion.

Test system operation step by step as summarized in SYSTEM DESCRIPTION.

Submit written report of test results signed by Company Field Advisor and the Director’s Representative. Also complete an NFPA Record of Completion.

Mount a copy of the written report of test results, and the NFPA 72 Record of Completion in plexiglass enclosed frame assemblies adjacent to the MFACP (one framed assembly for each report).

Include paragraph below when specifically requested by client agency (most applicable to O.G.S. projects).

* + - * 1. Conduct tests that are disruptive to facility personnel after normal working hours as directed.
      1. INSULATED CONDUCTOR SCHEDULE - TYPES AND USE
         1. Signaling Line Circuits, Initiating Device Circuits and Notification Appliance Circuits:

Power-Limited Circuits: For interior wiring (in raceways) use power-limited fire alarm circuit multiconductor cable types specified in PART 2 except where a 2-hour fire rated cable assembly is required.

Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits and not less than No. 16 AWG for initiating device circuits and notification appliance circuits.

Using Nonpower-Limited Wiring On Power-Limited Circuits: Wiring size and types specified for nonpower-limited circuits may be used for power-limited circuits if power-limited circuits are reclassified and the power-limited markings are eliminated. Refer to NFPA 70 Article 760-52(a) Exception No. 3.

Nonpower-Limited Circuits: For interior wiring (in raceways) use nonpower-limited fire alarm circuit single conductors or multiconductor cable types specified in PART 2 except where a 2-hour fire rated cable assembly is required.

Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits, not less than No. 16 AWG for initiating device circuits, and not less than No. 14 AWG for notification appliance circuits.

Where wiring is specifically indicated on drawings not to be run in raceway, use metal-clad cable type MC (concealed, unless otherwise indicated), except where a 2-hour fire rated cable assembly is required.

Omit paragraph below for single panel project.

* + - * 1. Signaling Line Circuit Between MFACP and Networked ICU’s (Network Communication Bus):

Use 2-hour fire rated cable assembly.

Where MI or MC/CI cable is used and run in areas subjecting cable to corrosion, use PVC or HDPR jacketed cable (nonmetallic jacketed cable is not suitable for use in ducts, plenums or other spaces used for environmental air). Use nonmetallic jacketed cable in the following areas:

Indicate areas where nonmetallic jacketed cable is required.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Include Section 271525 and subparagraph below when applicable (OGS projects). Omit for single panel project. Optical fiber cables are not available as a 2-hour fire rated cable assembly. Investigate possibility of running cable in 2-hour rated shafts or enclosures or other 2-hour rated construction and protecting cable with a method listed in UL building materials directory product category electrical circuit protective systems (FHIT) or electrical circuit protective materials (FHIY).

* + - * 1. Signaling Line Circuits Between MFACP and Networked ICU’s: Use Type LAN-O or type LAN-I optical fiber cables (Section 271525) in raceways for network communication bus circuits.
        2. Other Circuits for Which 2-Hour Fire Rated Cable Assembly is Specified or Indicated:

Use CI cable in rigid steel conduit, MI cable, MC/CI cable or FPL/EMT.

Where MI or MC/CI cable is used and run in areas subjecting cable to corrosion, use PVC or HDPR jacketed cable (nonmetallic jacketed cable is not suitable for use in ducts, plenums or other spaces used for environmental air). Use nonmetallic jacketed cable in the following areas:

Indicate areas where nonmetallic jacketed cable is required.

\_\_\_\_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_**.

* + - * 1. Control Circuits: Associated with the Fire Alarm System: Use Class 1, 2, and 3 wiring specified in Section 260519.
        2. Primary Supply Circuits and Secondary Supply Wiring:

1. Use electric light and power wiring specified in Section 260519.

END OF SECTION 283101

The remainder of this section is for information only. Not to be included in project specifications.

1. Codes, Standards, and References applicable to the installation of Fire Alarm Systems:

a. National Fire Protection Association (Handbooks):

1) Fire Protection Handbook.

2) Fire Alarm Signaling Systems.

3) National Fire Alarm Code Handbook.

b. National Fire Protection Association – NFPA 72 National Fire Alarm Code, 1999 edition Chapter 9 and it’s referenced mandatory documents:

1) NFPA 10, Standard for Portable Fire Extinguishers, 1998 edition.

2) NFPA 13 Standard for the Installation of Sprinkler Systems, 1999 edition.

3) NFPA 13D, Standard for the Installation of Sprinkler Systems in One-and Two-Family Dwellings and Manufactured Homes, 1999 edition.

4) NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, 1999 edition.

5) NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 1999 edition.

6) NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 1998 edition.

7) NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 1998 edition.

8) NFPA 54, National Fuel Gas Code, 1999 edition.

9) NFPA 58, Liquefied Petroleum Gas Code, 1998 edition.

10) NFPA 70, National Electrical Code*,* 1999 edition.

11) NFPA 75, Standard for the Protection of Electronic Computer/Data Processing Equipment, 1999 edition.

12) NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 1999 edition.

13) NFPA 101, Life Safety Code*,* 1997 edition. (Master Specification updated to 2000 Edition).

14) NFPA 110, Standard for Emergency and Standby Power Systems, 1999 edition.

15) NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 1996 edition.

16) NFPA 601, Standard for Security Services in Fire Loss Prevention, 1996 edition.

17) NFPA 780, Standard for the Installation of Lighting Protection Systems, 1997 edition.

18) NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, 1999 edition.

19) ANSI A-58.1, Building Code Requirements for Minimum Design Loads in Buildings and Other Structures,

20) ANSI S1.4a, Specifications for Sound Level Meters, 1985.

21) ANSI S3.41, Audible Emergency Evacuation Signal, 1996.

22) ANSI/ASME A17.1, Safety Code for Elevators and Escalators,1998.

23) ANSI/IEEE C2, National Electrical Safety Code, 1997.

24) ANSI/UL 217, Standard for Safety Single and Multiple Station Smoke Alarms, 1997.

25) ANSI/UL 268, Standard for Safety Smoke Detectors for Fire Protective Signaling Systems, 1999.

26) ANSI/UL 827, Standard for Safety Central-Station for Watchman, Fire-Alarm and Supervisory Services, 1997.

27) ANSI/UL 985, Standard for Safety Household Fire Warning Control Units, 1994.

28) ANSI/UL 1971, Signaling Devices for Hearing Impaired, 1995.

29) EIA Tr 41.3, *Telephones* (Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834.)

30) International Municipal Signal Association, P.O. Box 539, Newark, NY 14513 (Wire and Cable Specifications).

31) National Institute for Certification in Engineering Technologies, 1420 King Street, Alexandria, VA 22314-2794. (NICET Certification in the Field of Fire Protection and Engineering Technology)

c. National Fire Protection Association – NFPA 72 National Fire Alarm Code, 1999 edition, Appendix C and it’s referenced informational documents:

1) NFPA 11, Standard for Low-Expansion Foam, 1998 edition.

2) NFPA 11A, Standard for Medium- and High-Expansion Foam Systems, 1999 edition.

3) NFPA 12, Standard on Carbon Dioxide Extinguishing Systems, 1998 edition.

4) NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems, 1997 edition..

5) NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 1996 edition.

6) NFPA 15, Standard for Water Spray fixed Systems for Fire Protection, 1996 edition.

7) NFPA 17, Standard for Dry Chemical Extinguishing Systems, 1998 edition.

8) NFPA 80, Standard for Fire Doors and Fire Windows,1999 edition.

9) NFPA 90B, Standard for the Installation of Warm Air Heating and Air Conditioning Systems, 1999 edition..

10) NFPA 92A, Recommended Practice for Smoke-Control Systems, 1996 edition..

11) NFPA 92B, Guide for Smoke Management Systems in Malls, Atria, and Large Areas, 1995 edition..

12) NFPA 170, Standard for Fire Safety Symbols, 1999 edition.

13) ANSI S3.2, Method for Measuring the Intelligibility of Speech Over Communications Systems, 1989.

14) IEC 60849, Sound Systems for Emergency Purposes, Second Edition: 1998.

15) IEC 60268, Part 16, The Objective Rating of Speech Intelligibility by Speech Transmission Index, Second Edition: 1998.

d. NYS Uniform Fire Prevention and Building Codes:

1) 735.1(n) Floor Evacuation Procedure Signs (Multiple Dwellings).

2) 739.4(d)(8) Shafts (Multiple Dwellings).

3) 724 Fire Protection Equipment (Multiple Dwellings).

4) 765.1(n) Floor Evacuation Procedure Signs (General Building Construction).

5) 771.4(h)(10) Shafts (General Building Construction).

6) 774 Fire Protection Equipment (General Building Construction).

7) 791 Fire and Smoke Detecting System (Public Assembly).

8) 850 General Provisions for Systems and Equipment.

9) 1060 Fire Protection Equipment.

10) 1061 Coordinated Fire Safety System.

11) 1062.7(b) Emergency Operation (Elevators).

12) 1101.4(j) Emergency Warning Systems (Facilities for the Physically Handicapped).

13) 1101.5( c)(6) Communication Area of Refuge (Facilities for the Physically Handicapped

14) 1101.5( c)(8)(ii) Pressurized Elevator Lobby/Shaft (Facilities for the Physically Handicapped).

15) 1163.13( c)(4) sign “Call Fire Department by Telephone.”

16) 1250.1 Applicability (Reference Standards).

17) 1250.3 Reference standards applicable to State Uniform Fire Prevention and Building Code.

e. Underwriters Laboratories Inc.:

1) Fire Protection Equipment Catalogue (Listings and Classifications).

2) UL 13 Power-Limited Circuit Cables.

3) UL 38 Manually Actuated Signaling Boxes for Use with Fire-Protective Signaling Systems.

4) UL 44 Rubber-Insulated Wires and Cables.

5) UL 83 Thermoplastic-Insulated Wires and Cables.

6) UL 193 Alarm Valves for Fire-Protection Service.

7) UL 217 Single and Multiple Station Smoke Alarms.

8) UL 228 Door Closers-Holders, With or Without Integral Smoke Detecting devices.

9) UL 268 Smoke Detectors for Fire Protective Signaling Systems.

10) UL 268A Smoke Detectors for Duct Application.

11) UL 346 Waterflow Indicators for Fire Protective Signaling Systems.

12) UL 393 Indicating Pressure Gauges for Fire-Protection Service.

13) UL 444 Communications Cables.

14) UL 464 Audible Signal Appliances.

15) UL 497A Secondary Protectors for Communications Circuits.

16) UL 497B Protectors for Data Communications and Fire Alarm Circuits.

17) UL 521 Heat Detecting devices for Fire Protective Signaling Systems.

18) UL 539 Single and Multiple Station Heat Detecting devices.

19) UL 753 Alarm Accessories for Automatic Water-Supply Control Valves for Fire Protection Service.

20) UL 864 Control Units for Fire Protective Signaling Systems.

21) UL 910 Test For Cable Flame - Propogation and Smoke Density Values for Electrical and Optical-Fiber Cables Used in Spaces Transporting Environmental Air.

22) UL 1076 Proprietary Burglar Alarm Units and Systems.

23) UL 1424 Cables for Power-Limited Fire-Alarm Circuits.

24) UL 1425 Cables for Non-Power-Limited Fire-Alarm Circuits.

25) UL 1480 Speakers for Fire Protective Signaling Systems.

26) UL 1481 Power Supplies for Fire Protective Signaling Systems.

27) UL 1638 Visible Signaling Appliances - Private Mode Emergency and General Utility Signaling.

28) UL 1711 Amplifiers for Fire Protective Signaling Systems.

29) UL 1971 Signaling Devices for Hearing Impaired.

30) UL 2196 Tests of the Fire Resistive Cables.

f. American National Standards Institute:

1) ASME/ANSI A17.1 Safety Code for Elevators and Escalators.

2) ASME/ANSI A17.3 Safety Code for Existing Elevators and Escalators.

3) ANSI A117.1 - Accessible and Usable Buildings and Facilities.

4) ANSI S-1.4a Specifications for Sound Level Meters.

5) ANSI S3.41 Audible Emergency Evacuation Signal.

g. National Electrical Manufacturers Association (NEMA):

1) Guide for Proper Use of Smoke Detectors in Duct Application

2) Guide for Proper Use of System Smoke Detectors.

3) Quality Automatic Fire Detection and Alarm System Installation.

4) Training Manual on Fire Alarm Systems.

2. Indicate on drawings where specific initiating devices are to be used. In general:

a. Use combination rate-of-rise/fixed temperature heat detectors or heat sensors (135 degrees F) as the basic heat detecting device except where temperature could rise more than 15 degrees F per minute (use fixed temperature heat detector).

1) Use combination R.O.R./F.T. (190/200 degrees F) for higher ambient temperature locations: boiler rooms, etc. Heat sensors are not available above 135 degrees F.

b. Use fixed temperature heat detecting devices (135 degrees or 190/200 degrees F to suit ambient conditions) where temperature could rise more than 15 degrees F per minute: near heating supply registers, in generator rooms, near large exterior doors, etc.

c. Use rate compensation/fixed temperature heat detectors or heat sensors where a faster acting heat detecting device may be required (computer rooms, etc.):

1) Rate compensation/fixed temperature heat detectors have a tube 3 inches long that extends down from the ceiling, making them more prone to damage and less aesthetically pleasing.

d. Use ionization type smoke detectors or smoke sensors as spot type detecting devices in areas where the following statement would be applicable: “Ionization detection is more responsive to invisible (less than one micron in size) particles produced by most flaming fires. It is somewhat less responsive to the larger particles typical of most smoldering fires”. Do not use ionization type for the following applications:

1) In dirty laundry storage areas (urine fumes activate ionization type smoke detecting device.

2) In areas subject to high velocity air movements (especially not in front of heating and air conditioning supply registers).

3) In areas where people can gather to smoke.

4) In kitchens, shops, garages and other areas where smoke or fumes are given off during normal activities.

5) In areas where ether or other volatile chemicals are used.

e. Use photoelectric type smoke detectors or smoke sensors as spot type detecting devices in areas where the following statement would be applicable: “Photoelectric light scattering detection is more responsive to visible (more than one micron in size) particles produced by most smoldering fires. It is somewhat less responsive to the smaller particles typical of most flaming fires. It is also less responsive to black smoke than to lighter colored smoke”.

1) Also use photoelectric type smoke detecting devices where normal activities might cause ionization type to alarm (listed in d. above).

2) Since photoelectric smoke detecting devices sense particles of combustion differently than ionization type, a more effective coverage could be achieved by using both types in critical locations: Sleeping area, corridors, etc.

END OF INFORMATION 283101