1. GENERAL SPECIFICATION

1.1 The contractor shall provide a Kidde Gemini II microprocessor based, conventional, single hazard or distributed intelligence multi-hazard Fire Alarm-Suppression Control System as described in subsequent sections of this specification to perform the following functions:

A. Fire Alarm, Supervisory and Trouble event initiation
B. Occupant notification
C. Event annunciation
D. Safety procedures activation and required equipment interlocks
E. Fire Suppression System release
F. Off-premises transmission.

1.2 The contractor shall supply the complete Fire Alarm-Suppression Control System with components that shall include but not be limited to the following (unless prohibited by Codes and Standards referenced in Section 2):

A. Suppression System as described elsewhere.
B. Fire Alarm-Suppression Control Panel
C. Detection System consisting of Smoke and (or) Heat Detectors
D. Manual Release Stations
E. Abort Stations
F. Audio-Visual Notification Appliances

1.3 All of the Fire Alarm-Suppression Control System components as listed in Section 1.2 above must be manufactured and/or supplied by Kidde Fire Systems, 400 Main Street, Ashland, MA 01721, U.S.A., phone: (508) 881-2000,

URL: http://www.kiddefiresystems.com

The manufacturer shall warrant the Kidde Gemini II Fire Alarm-Suppression Control System, Fenwal Detectors and peripheral products manufactured by it for a period of eighteen (18) months from the date of shipment.

1.4 The system shall be supplied and installed by a factory authorized Kidde Fire Systems distributor. The distributor shall be trained by the manufacturer to design, install, test and maintain the Kidde Gemini II Fire Alarm-Suppression system and shall be able to produce a certificate stating such on request.
1.5 The factory authorized Kidde Fire Systems distributor shall confirm in writing that he stocks a full complement of spare parts and offers 24-hour emergency service for all equipment being furnished.

1.6 All materials and equipment used for this project shall be new and unused.

2. CODES/STANDARDS COMPLIANCE

2.1 The design, installation, testing and maintenance of the Fire Alarm-Suppression system shall be in accordance to the following codes, standards and regulatory bodies:

A. NFPA 12: Standard on Carbon Dioxide Extinguishing Systems
B. NFPA 12A: Standard on HALON 1301 Fire Extinguishing Systems
C. NFPA 13: Standard for the Installation of Sprinkler Systems
E. NFPA 16: Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
F. NFPA 17: Standard for Dry Chemical Extinguishing Systems
G. NFPA 17A: Standard for Wet Chemical Extinguishing Systems
H. NFPA 70: National Electrical Code
K. NFPA 76: Fire Protection of Telecommunications Facilities
L. NFPA 2001: Standard for Clean Agent Fire Extinguishing Systems
N. Underwriters Laboratories, Inc. listings.
O. Requirements of the local Authority Having Jurisdiction.

2.2 All of the components of the Fire Alarm-Suppression system shall be listed/approved by Underwriters Laboratories Inc (UL/cUL/ULC), Factory Mutual System (FM), California State Fire Marshal (CSFM) and Materials and Equipment Acceptance Division of New York City (MEA).

2.3 The manufacturer of the Fire Alarm-Suppression system shall have a minimum of 15 years experience in the design, production and distribution of fire detection, fire alarm and fire suppression systems.
2.4 The manufacturer of the Fire Alarm-Suppression system shall be certified to ISO 9001 for a minimum period of 5 years for the design, production and distribution of fire detection, fire alarm and fire suppression systems.

3. SYSTEM DESCRIPTION

3.1 The Kidde Gemini II Fire Alarm-Suppression Control System shall consist of a Main Control Panel that provides control for one (1) suppression zone or hazard. The System shall be field-expandable to provide control for up to seven (7) additional independent suppression hazards; such expansion achieved by the use of an equal number of Remote Hazard Units. For remote display purposes, the System shall be further field-expandable to provide up to sixteen (16) Remote Display Units. Except for any optional features provided, all Kidde Gemini II System control units shall be of a single board design and construction and must be factory equipped with all required controls as described in subsequent sections for one suppression hazard.

3.2 The Kidde Gemini II System shall be listed to be compatible with Fenwal Conventional point-type Ionization and Photoelectric Detectors, Normally Open contact type Thermal Detectors and switches, Kidde Solenoid operated Control Heads, Factory Mutual Sprinkler Solenoid Valves and Fenwal Audio-Visual Notification Appliances.

3.3 The distributed intelligence of the Kidde Gemini II System shall extend to the Remote Hazard Units. The Remote Hazard Units shall being capable of operating in stand-alone mode in case of system communications failure and must be able to activate their respective suppression system if called upon to do so during this degrade mode. Conventional Multi-Hazard Panels designed with modular construction and centralized architecture, with one centrally located panel and input/output field wiring running to and from all the protected zones shall not be acceptable.

3.4 All System components provided with a key-lock feature shall be keyed alike.

4. COMPONENTS – DESCRIPTION AND OPERATION

4.1 Kidde Gemini II Main Control Panel

A. The single hazard Main Control Panel shall consist of a single Printed Circuit Board with the main microprocessor and an integral Display-Control Module, a primary Power Supply Unit, a 24 VDC Battery backup complete with Battery Charger in an 18 gauge painted NEMA 1 steel enclosure with door. The enclosure shall be size capable of housing the Printed Circuit Board, the Power Supply Unit and a Battery of capacity 12 AH at 24 VDC. Enclosures intended for use in Canada shall be provided an additional steel dead-front plate. Battery cabinets shall be available to accommodate batteries of capacity 17 to 66 AH at 24 VDC.
B. The Main Control Panel (MCP) Power Supply Unit shall operate on 120/240 VAC 50/60 Hz Mains Supply. The Power Supply Unit shall automatically detect the input voltage and all of the unit components shall function normally without any damage whatsoever if either voltage is applied to the AC Input terminals.

C. The Main Control Panel (MCP) Power Supply Unit shall provide two Auxiliary Outputs rated 0.5 Amp total at 24 VDC for external use. One of the outputs shall be resettable and the other shall be non-resettable.

D. The battery backup system shall consist of 24 VDC, maintenance free, sealed lead acid batteries of capacity such as to provide for Standby operation followed by Alarm operation for the time duration listed below in case of AC Mains failure. The battery charger shall be capable of charging a fully discharged battery within 48 hours. The calculated battery capacity must be de-rated by a minimum of 10% to arrive at the required Battery capacity:

1. Local or Central Station (protected premises) per NFPA 72:
   ♦ Standby operation: 24 hours
   ♦ Alarm operation: 5 minutes

2. Clean Agent Suppression System per NFPA 12A and 2001
   ♦ Standby operation: 24 hours
   ♦ Alarm operation: 5 minutes

3. Deluge/Pre-Action System per Factory Mutual
   ♦ Standby operation: 90 hours
   ♦ Alarm operation: 10 minutes

E. The Main Control Panel (MCP) shall supervise and control the overall system operation, including the execution of the site-specific configuration. Its printed circuit board shall contain the hazard-specific input and output circuits.

F. The MCP Display-Control Module shall provide one 4 line by 20 character, alphanumeric, backlit Liquid Crystal Display (LCD). The LCD shall as a minimum, indicate the current Date & Time and System status, the status of individual input and output circuits and a summary of Alarm, Supervisory and Trouble events. The LCD shall also provide a countdown timer to indicate the time remaining prior to an impending Agent release. The Display-Control Module shall be provided Light Emitting Diodes (LED) to indicate Power ON, Alarm, Trouble, Supervisory and Signal Silenced. The Display-Control module shall have System Reset, Signal Silence, Alarm Scroll and Supervisory/ Trouble Scroll Control keys and Menu Control keys (navigation, Cancel and Accept) so as to provide access to the system menus. All access to the Menu System shall be password protected. A system buzzer shall annunciate each Alarm, Supervisory, or Trouble event.
G. Kidde Gemini II Systems intended to be installed in Canada shall have up to 3 additional door mounted LED Display Modules (one per Hazard) with 16 LEDs each to provide the indications required by ULC-S527-99.

H. The MCP shall be provided the following Input and Output circuits:

1. 2 Initiating Device Circuits in Style B or Style D supervision.
   ♦ The Initiating Device Circuits shall be field-configurable in either style of supervision without the use of any converter boards. Each circuit shall allow a field wire resistance of 50 ohms per loop and shall be capable of supporting Normally Open contact-type alarm devices as well as a minimum of 40 Fenwal Conventional point-type smoke detectors in any combination. The Initiating Device Circuits shall be configurable to activate the Suppression System either on the occurrence of a first alarm or in the case of a cross-zone alarm.
   ♦ The contractor shall only utilize Fenwal smoke detectors that have been UL listed for compatibility with the Kidde Gemini II panel.

2. 1 Waterflow Circuit in Style B or Style D supervision.
   ♦ The Waterflow Circuit shall be field-configurable in either style of supervision without the use of any converter boards. The circuit shall be capable of supporting switches using Normally Open contacts and shall allow a field wire resistance of 50 ohms per loop.

   ♦ The circuit shall be capable of supporting Kidde Manual Pull Stations using Normally Open contacts and shall allow a field wire resistance of 200 ohms. The release of Agent subsequent to the operation of the Manual Release shall be configurable to be either instantaneous or delayed. If delayed, the time delay shall be the same as set for the automatic release except that it shall not exceed 30 seconds. The operation of the Manual Release shall override any existing Abort Station input.
   ♦ The contractor shall only utilize Kidde Pull Stations that have been UL listed for compatibility with the Kidde Gemini II panel.

4. 1 Abort / Supervisory # 2 Circuit in Style B supervision.
   ♦ The circuit shall be capable of being configured either as an Abort Circuit or a Supervisory Circuit.
When configured as abort, the circuit shall be capable of supporting Kidde Abort Stations using momentary Normally Open contacts and shall allow a field wire resistance of 200 ohms. The circuit shall be configurable to either enable or disable the generation of a Pulsed Abort Tone on activation of an Abort Switch. When enabled, the circuit is shall be configurable to operate in one of the following four modes:

a. Abort Mode 1 per UL 864. On activation, timer holds at 10 seconds. On release, countdown continues to zero.

b. Abort Mode 2. On activation, timer resets to initial value. On release, countdown continues to zero.

c. Abort Mode 3 per IRI for cross-zoned systems. Shall be similar to Abort Mode 1. Activation must be during pre-release.

d. Abort Mode 4 per NYC. On activation, timer is reset to 2 minutes. On release, the timer restarts.

The contractor shall only utilize Kidde Abort Stations that have been UL listed for compatibility with the Kidde Gemini II panel.

When configured as Supervisory # 2, the circuit shall operate in a manner identical to Supervisory Circuit # 1 described elsewhere in this specification.

5. 1 Supervisory Circuit # 1 in Style B supervision.

The circuit shall be capable of supporting switches using Normally Open contacts and shall allow a field wire resistance of 200 ohms.

6. 2 Notification Circuits in Style Y or Style Z supervision.

The Notification Circuits shall be field-configurable in either style of supervision without the use of any converter boards. The combined total power available to the circuits shall be 2.5 Amps at 24 VDC. Both circuits shall be individually configurable to activate on one or more of the conditions of First Alarm, Waterflow, Pre-Discharge, Manual Release and Discharge. In the event of the occurrence of any of the above conditions, the circuits shall generate the sound pattern of Silent, Pulse at 60 beats per minute, Pulse at 120 beats per minute, Temporal or Steady, as field-configured. Each of the above sound patterns and conditions shall be configurable to be either Silenceable or Non-Silenceable (On until Hazard Reset) with the exception of the Silent pattern and the Waterflow condition. It shall not be possible to configure both circuits to be silent for the same alarm condition. The Waterflow condition shall always be Non-Silenceable.

The contractor shall only utilize Fenwal Alarm Signals that have been UL listed for compatibility with the Kidde Gemini II panel.
7. 1 Agent Release Circuit in Style Y supervision.
   ♦ The Agent Release Circuit shall be capable of operating the following 24 VDC Release Devices in the listed configurations:
     e. 1, 2 or 3 Kidde Control Heads
     f. 1 FM Deluge Solenoid
     g. 1 Kidde Control Head plus 1 FM Deluge Solenoid
   ♦ The contractor shall only utilize the following release devices that have been UL listed for compatibility with the Kidde Gemini II panel:
     h. Kidde 24 VDC Control Head P/N 890181
     i. Kidde 24 VDC Control Head P/N 899175
     j. Kidde 24 VDC Control Head P/N 48650001
     k. Kidde 24 VDC Control Head P/N 81-100000-001
     l. Factory Mutual 24 VDC Solenoid Group A, B, D, E and G.
   ♦ The circuit design shall be such that no additional module(s) are required to be wired between the Main Control Panel Release Circuit terminals and the Release Devices listed above for proper operation of the Suppression System.
   ♦ The circuit shall be configurable so as to provide activation power to Control Heads for 90 seconds and to Deluge Solenoids for 10 minutes, 15 minutes or On-Until-Reset.
   ♦ The circuit shall be configurable so that release of agent in the affected area may either be instantaneous or delayed by a maximum of 60 seconds. The site-specific time delay shall be configurable up to the maximum allowed in steps of 1 second.

8. 1 System Alarm Relay.
   ♦ The Alarm Relay shall be normally de-energized and shall have Form-C contacts rated 3 Amps at 120 VAC / 30 VDC. The relay shall be latching and shall transfer on any alarm in the system.

9. 1 System Trouble Relay.
   ♦ The Trouble Relay shall be normally energized and shall have Form-C contacts rated 3 Amps at 120 VAC / 30 VDC. The relay shall be non-latching and shall transfer on any trouble in the system.
10. 1 System Programmable Relay.

- The Programmable Relay shall be normally de-energized and shall have
  Form-C contacts rated 3 Amps at 120 VAC / 30 VDC. The contacts shall be
  programmable to transfer and latch on any one of the following conditions:
  m. Global First Alarm (Un-Decision) Condition
  n. Global Pre-Discharge (Decision) Condition
  o. Global Discharge Condition
  p. Global Waterflow Input
  q. Global Manual Release
  r. Global Abort Input
  s. Global Supervisory Input
  t. Global Trouble Condition

11. All Input and Outputs shall be provided appropriate numbers of terminals of
    capacity suitable for 18 to 12 AWG wiring.

4.2 Kidde Gemini II Remote Hazard Units with Display

A. The mechanical design and functionality of the Remote Hazard Unit (RHU) with
   Display Module shall be as described in Section 4.1 for the Main Control Panel
   (MCP) and the following:

B. The RHU Display-Control Module shall be provided with One 4 line by 20 character
   LCD that shall be configurable to indicate the occurrence of either global or local
   events. It shall be provided System Control Keys for Reset, Signal Silence, Alarm
   Scroll and Supervisory/Trouble Scroll. It shall also be provided 5 LED Indicators for
   Power ON, Alarm, Supervisory, Trouble and Signal Silenced. Access to the History
   Event log and its storage in non-volatile memory shall be provided only from the
   MCP. All site-specific system configurations via the Menu System shall be
   performed on the MCP. It shall not be possible to reset either the Main Control
   Panel or other Remote Hazard Units from any Remote Hazard Unit. The System
   Alarm, System Trouble and System Programmable Relays shall be provided only on
   the Main Control Panel. It shall be possible to assign a 7-character tag-name to the
   Remote Hazard Unit.

4.3 Kidde Gemini II Remote Hazard Units without Display

A. The mechanical design and functionality of the Remote Hazard Unit (RHU) without
   Display Module shall be as described in Section 4.1 for the Main Control Panel
   (MCP) and the following:
B. This version of the Remote Hazard Unit shall not be provided with an integral Display-Control Module. Access to the History Event log and its storage in non-volatile memory shall be provided only from the MCP. All site-specific system configurations via the Menu System shall be performed on the MCP. It shall not be possible to reset either the Main Control Panel or other Remote Hazard Units from any Remote Hazard Unit. The System Alarm, System Trouble and System Programmable Relays shall be provided only on the Main Control Panel. It shall be possible to assign a 7-character tag-name to the Remote Hazard Panel. Remote Hazard Units without Displays shall not be utilized for Canadian applications.

4.4 Optional Relay Board (ORB)

A. The Main Control Panel, Remote Hazard Unit (both with and without Display) shall have the facility to be provided with an add-on Optional Relay Board. The Optional Relay Board shall be equipped with 5 normally de-energized Programmable Relays. Form-C contacts shall be rated 3 Amps at 120 VAC / 30 VDC. The contacts shall be individually programmable to transfer and latch on any one of the following conditions:

1. Local First Alarm (Un-Decisive) Condition
2. Local Pre-Discharge (Decisive) Condition
3. Local Discharge Condition
4. Local Waterflow Input
5. Local Manual Release
6. Local Abort Input
7. Local Supervisory Input
8. Local Trouble Condition

B. On Canadian listed systems, ORBs shall be mounted only on Remote Hazard Units.

C. The Relay contact terminals on the ORB shall be of size suitable for 18 to 12 AWG wiring.

4.5 Kidde Gemini II Remote Display Units

A. The Remote Display Unit (RDU) shall consist of a single Printed Circuit Board with an integral Display-Control Module. The RDU shall operate on 24 VDC received either from the non-resettable Auxiliary Power Output on the MCP, an RHU or a UL Listed Power Supply Unit.
B. The RDU Display-Control Module shall be similar to that on the MCP and shall be provided One 4 line by 20 character LCD that shall be configurable to indicate the occurrence of either global or local events. It shall be provided System Control Keys for Alarm Scroll and Supervisory/Trouble Scroll and 1 LED Indicator that shall be Steady Green in Normal Operations, Off when Input power is not available and Flashing Amber when Communications are lost.

C. It shall be possible to assign an RDU to the MCP or to any RHU on the System. If an RDU is so assigned, it shall be configurable to accept the following Input circuits from the protected area to which it is assigned:

1. 1 Manual Release Circuit in Style B supervision. This circuit shall be of design exactly similar to the Manual Release Circuit provided on the Main Control Panel.

2. 1 Abort Circuit in Style B supervision. This circuit shall be of design exactly similar to the Abort Input Circuit provided on the Main Control Panel.

D. It shall be possible to assign a 7-character tag-name to the Remote Display Unit.

4.6 Kidde Gemini II Menu System

A. The Kidde Gemini II Menu System shall only be accessible from the MCP Display-Control Module keypad. It shall be pass code protected to prevent unauthorized access and shall provide the following functions:

1. The Set Function shall enable the installer/operator set or change the site specific parameters, which shall include but not be limited to Current Date and Time, Pass code, hazard-specific configuration and Device Tag name.

2. The List Function shall enable the installer/operator list the current as well as two previous site specific configuration settings. It shall also be possible to list the Isolated Devices and Event History Log. A minimum of 270 events shall be stored in system non-volatile memory. The event history log shall not be erased, lost or otherwise damaged in the case of a complete power failure. It shall be possible to list the entire event log as well as a range of events by date if so desired.

3. The Isolate Function shall enable the installer/operator either isolate or de-isolate the input and output circuits on the MCP, RHU or RDU. It shall be possible to isolate or de-isolate all input and output circuits. The isolation of any circuit shall cause a trouble event display. It shall be recorded in the event history log and shall cause the buzzer to sound. The de-isolation of a circuit shall also be recorded in the event history log.
4. The Test Function shall enable the installer/operator perform a Walk Test and a Battery Test. A system when in Walk test shall display and record a trouble message. The occurrence of an Alarm event in part of the system not in Walk test mode shall cause the immediate cancellation of the Walk Test. A system in Battery test shall display the Battery Open circuit voltage and charging current. It shall be possible to remotely conduct an RHU battery test from the system MCP.

4.7 Kidde Gemini II Communication System

A. The Main Control Panel shall communicate with any and all Remote Hazard Units (up to a maximum of 7) and Remote Display Units (up to a maximum of 16) installed on the system via a high fault tolerant Class A Style 7 RS-485 network. Both channels on the RS-485 network shall be routed in separate conduits so as to follow two independent geographical routes. The minimum allowable length of each channel, that is the wire distance between the Main Control Panel and the last Remote unit on the network, shall be 4,000 feet (1,219 meters). The Main Control Panel shall poll all System units at the minimum rate of 2 times per second. If both Channels fail, the RHUs shall operate in stand-alone mode and shall release Agent if called upon to do so.

4.8 Fenwal CPD-7051 Ionization Detectors

A. The Ionization Detector shall be a dual chamber, low profile, conventional type that senses both visible and invisible products of combustion.

B. The sensing chamber shall permit a full 360° smoke entry.

C. The Detector shall mount to a twist-to-lock base, Model 2WB.

D. The Detector shall be suitable for open-air velocities up to 2,000 fpm and shall have a nominal sensitivity of 1.3% obscuration per foot. It shall be possible to perform a sensitivity check on the detector without the need for generating smoke.

E. The strength of the Americium 241 radioactive source shall not exceed 0.7 microcurie. Detectors with higher radioactive strengths shall not be acceptable.

F. The Detector shall be provided a response LED. This LED shall flash to indicate power and shall light up steady with full brilliance on alarm.

G. All field wire connections shall be made to the base through the use of a clamping plate and screw.
4.9 Fenwal PSD-7155, PSD-7155P and PSD-7156 Photoelectric Detectors

A. The Photoelectric Detector shall be a light-scattering, low profile, conventional type that senses a broad range of smoldering and flaming-type fires.

B. The sensing chamber shall permit a full 360° smoke entry.

C. The Detector shall mount to a twist-to-lock base, Model 2WB.

D. The PSD-7155 and PSD-7156 detectors shall be suitable for open air velocities up to 300 fpm and shall have a nominal sensitivity of 1.47 to 3.75% obscuration per foot. The PSD-7155P Detector shall be suitable for open air velocities up to 4,000 fpm and shall have a nominal sensitivity of 0.83 to 2.00% obscuration per foot. It shall be possible to perform a sensitivity check on the detector without the need for generating smoke.

E. The Detector shall be provided a response LED. This LED shall flash to indicate power and shall light up steady with full brilliance on alarm.

F. The PSD-7156 Detector shall include a thermister heat detector with 135°F (57°C) set point which operates independent of the smoke detector operation.

G. All field wire connections shall be made to the base through the use of a clamping plate and screw.

4.10 Typical Sequence of Operation

A. Activation of the extinguishing system shall be via crossed-zoned smoke detection. One half of the crossed-zoned smoke detection system shall consist of PSD-7155, PSD-7156 or PSD-7155P Photoelectric Detectors and the other half of CPD-7051 Ionization Detectors.

B. Photoelectric Detectors shall be used as the primary pre-alarm detection system because they are more likely to alarm during the pre-combustion or early stages of the fire development. Ionization Detectors shall be utilized primarily as a fire-confirmation detector to ensure the presence of a flame before the extinguishing system is discharged. Ionization Detectors are small-particle detectors and are more likely to respond to flaming fires. All of the gaseous extinguishing agents are only effective on flaming fires, and must not be discharged during the incipient or smoldering stages of a fire.

C. Spot-type detectors from each half of the crossed-zoned detection system shall be alternated throughout the protected area. It shall require the activation of at least one detector from each of the two crossed-zoned detector groupings to trigger the automatic release of the extinguishing system.
D. Systems that use multi-criteria detectors that cannot be programmed to respond to the various stages of fire development, or systems that do not use different smoke detection principles to confirm the presence of a flaming fire, shall not be considered as equivalent or as meeting the intent of this specification.

E. Activation of any smoke detector in the suppression zone shall:
   1. Cause a pre-alarm condition
   2. Create an audible and visible indication on the control unit display and any associated remote display
   3. Display the zone of the detector in alarm
   4. Activate audible pre-alarm notification appliances (e.g., bells) in the affected area
   5. Perform any necessary control functions such as HVAC equipment shutdown and activate any safety procedures such as closing doors
   6. Transmit an off-premises report to a Listed central or remote station, or directly to the local fire department.

F. Activation of a smoke detector from each of the two crossed zones shall:
   1. Cause a pre-release condition
   2. Create an audible and visible indication on the control unit display and any associated remote display
   3. Display the zones of the detectors in alarm
   4. Initiate a programmable time delay, and indicate the time remaining prior to extinguishing-system discharge
   5. Activate audible and visual notification appliances (e.g., horns and strobes) in the affected area
   6. Perform any necessary control functions such as the closure of dampers and activate any safety procedures such as closing doors.

G. The system shall, upon expiration of the time delay,
   1. Cause a release condition and energize the control head to discharge the extinguishing agent into the protected area
   2. Create an audible and visible indication on the control unit display and any associated remote display
   3. Display the attainment of the discharge condition
4. Continue to activate the audible and visual notification appliances (i.e., strobes) in the affected area

5. Perform any necessary control functions such as the emergency power off of all electrical equipment except for lighting and circuits required for life safety.

H. The extinguishing system shall be capable of manual activation by Dual Action Manual Release Stations. Operation of a Manual Release Station shall cause all alarm and shutdown devices to operate as if the system had operated automatically and shall cause an immediate activation of the fire extinguishing system. Operation of a Manual Release Station shall override the operation of all Abort switches.

I. Abort Stations shall, when operated, interrupt the countdown delay for the activation of the extinguishing system and prevent the operation of any alarms and control functions associated with the discharge of the extinguishing agent. The abort switches shall be momentary, dead-man type devices that require a constant force to remain engaged and active. Manual Release Stations shall override the operation of any Abort Station. Abort Station shall be configured for operation according to the requirements of the authority having jurisdiction.

4.11 General Electrical Materials

A. All electrical enclosures, raceways, and conduits shall be provided and installed in accordance with applicable codes and intended use, and shall contain only those electrical circuits associated with the fire detection and control system. No circuit or circuits that are unrelated to the fire-suppression system shall be routed through the enclosures, raceways, and conduits dedicated to the fire suppression system.

B. All conductors shall be enclosed in rigid or thin walled, steel conduit unless open wiring is permitted by the local electrical code.

C. Any conduit or raceway exposed to dampness or other similar conditions shall be properly sealed and installed to prevent moisture entrapment. Provisions for draining and drying shall be employed as required.

D. All wiring shall be of the proper size to conduct the circuit current, but shall not be smaller than #18 AWG unless permitted by the local electrical code. Wire that has scrapes, nicks, gouges, or crushed insulation shall not be used. The manufacturer's minimum wire-bending radii shall be observed in all enclosures, raceways, and conduits. Aluminum wire shall not be used.

E. Splicing of circuits shall be kept to a minimum, and is only permitted in an electrical box suitable for the purpose. Appropriate hardware shall be used to make the wire splices. Wires that are spliced together shall have the same color insulation.
F. White colored wire shall be used exclusively for the identification of the neutral conductor of an alternating-current circuit. Green colored wire shall be used exclusively for the identification of the earth-ground conductor of an AC or DC circuit.

G. Appropriate color-coding shall be utilized for all other field wiring.

H. All electrical circuits shall be numerically tagged with suitable markings at each terminal point. All circuits shall correspond with the installation drawings.

5. SUBMITTALS

5.1 The factory-authorized Kidde Fire Systems Distributor shall provide the following drawings and documentation, acceptable to the local AHJ, for approval prior to starting any work on the project:

A. Installation and Electrical layouts drawn to the scale depicting the locations and mounting details of the all equipment

B. Details of Auxiliary functions required such as equipment shutdown, door holders, etc.

C. The complete point-to-point conduit routing plan.

D. Internal Wiring Diagrams for the Main Control Panel, all Remote Hazard Units and all Remote Display Units on the System showing the power supply requirements and all field wire terminations.

E. Calculations performed in accordance with the Manufacturers recommendations to justify the capacities of all standby batteries used on the system.

F. A document detailing the sequence of system operations and outputs provided on the receipt of individual system activation inputs.

5.2 The contractor shall submit a test plan that describes how the system shall be tested. This shall include a step-by-step description of all tests and shall indicate type and location of test apparatus to be used. Tests shall not be scheduled or conducted until the engineer of record approves the test plan.

5.3 The contractor shall submit Ten (10) copies of shop drawings and product data sheets.

5.4 The contractor shall submit Five (5) copies of the Kidde Gemini II Design, Installation, Operation and Maintenance Manual after complete installation.

6. SYSTEM INSTALLATION, COMMISSIONING AND MAINTENANCE

6.1 The contractor shall install the system in accordance with the manufacturer's installation, operation and maintenance manual.
6.2 The contractor shall be certified and trained by the manufacturer on design, installation, operation and maintenance of the Kidde Gemini II Fire Alarm-Suppression Control System. The certification must be valid throughout the completion time period for the project.

6.3 The contractor shall record all equipment, tests and system configurations in a format approved by the manufacturer and/or the local Authority Having Jurisdiction. A copy of the commissioning results shall be provided to the end-user.

6.4 The Kidde Gemini II System shall be maintained as recommended by the manufacturer’s Design, Installation, Operation and Maintenance Manual, the relevant NFPA Codes and the requirements of the local Authority Having Jurisdiction.