# CITY OF CONCORD NEW HAMPSHIRE

# FIRE ALARM REGULATIONS

Fire Alarm Regulations
City of Concord, New Hampshire
February 1, 2001

# Section 1 - Administration

<u>Code Official:</u> Shall mean any or all persons responsible for reviewing and approving systems design.

- **1.1 Intent -** The intent of these regulations is to ensure all fire alarm systems installed in the City of Concord are designed, installed and maintained to achieve the following:
  - a. High reliability.
  - b. Conformity of system design with national standards and Concord Fire Department standard operating guidelines.
  - c. Ease of operation and understanding.
  - d. Protection of life and property within the City of Concord with regard to system quality.
  - e. Reduction of needless alarms.
- **1.2 Scope -** These regulations shall apply to all fire alarm systems installed in the City of Concord.
- **1.3 Authority** The Fire Chief and Code Administrator or his/her designee shall approve the design and installation of all fire alarm systems, master box locations, key vault locations and connection of the fire alarm systems to the municipal alarm system of the City of Concord.
- **1.4 Tests** All fire alarm systems shall be fully tested in the presence of the appropriate Code official and approved before the system is placed in service.
- 1.5 Variances
- **1.5.1** The Fire Chief and Code Administrator or his/her designee may grant a variance to the provisions of these regulations when circumstances arise that makes strict adherence to portions of these regulations impractical.
- 1.5.2 Requests for variance to these regulations shall be made by the property owner, the owner's agent in writing to the Fire Chief and Code Administrator. This request shall specify the section of these regulations to which variance is sought and a complete explanation of the conditions that make strict adherence impractical. This request shall be submitted prior to review or approval of plans.
- **1.6 Approval -** The issuance of a permit shall mean acceptance to the City of Concord fire regulations.

# Section 2 - General Requirements

- **Scope -** The application, design, installation, performance and maintenance of fire alarm systems in the City of Concord shall comply with NFPA 72, The National Fire Alarm Code, Latest Edition.
- **2.2 Permit** A Fire Prevention Permit is required for the installation of any fire alarm system. (See Section 9).
- **2.3 Plans -** Two complete sets of plans and product specifications must be submitted for review to Code Administration for acceptance prior to any installation. Plans shall meet all requirements of **Section 3.9.1.**

- The Code Administration Division shall forward one copy of the plans to the Fire Department for review.
- **2.4 Review -** Code administration shall review and accept or disapprove all plans submitted within 14 working days from submittal.
- 2.5 Fire Department Connections Installations within 2,000 feet of the area served by the municipal alarm system shall be connected to this system by a master fire alarm box if direct fire department notification is desired or required by occupancy classification.
- **Occupancies Requiring Connection -** The following occupancies must have fire alarm systems connected to the fire department via the municipal alarm system:
  - A. New Assembly occupancies with an occupancy capacity of 100 or more, Existing Assembly occupancies which increase seating capacity by 25 or more.
  - B. Educational Facilities with more than six {6} students
  - C. New Child Daycare centers with more than six {6} children
  - D. Hospitals, nursing homes and limited care facilities
  - E. Detention and correctional facilities
  - F. Hotels, motels, and dormitories housing more than sixteen {16} persons
  - G. New lodging or rooming houses with four {4} or more occupants
  - H. Residential board and care facilities with four {4} or more occupants having a slow evacuation capability.
  - I. Class-A mercantile occupancies covered malls and covered mall buildings as defined by Life Safety Code or BOCA Building Code.
  - J. Business occupancies two {2} or more stories in height above the level of exit discharge or 300 or more total occupants.
  - K. Industrial occupancies with total capacity of 100 or more persons or if more than 25 persons are above or below the level of exit discharge.
  - L. Storage occupancies in excess of 50,000 square feet of aggregate floor area
  - M. Underground or windowless structures (excluding one or two family), occupied towers and high-rise occupancies as defined by Life Safety Code or Building Code.
  - N. Any special hazard/extra hazard use or occupancy as determined by the Fire Chief and Code Administrator or his /her designee.
  - O. Apartment buildings four {4} or more stories in height or housing 12 or more units.
  - P. All new sprinkler systems shall have a direct fire alarm connection to the Fire Department.
- 2.7 Non-Required protection of premises systems shall meet the requirements of {NFPA 72 section 3-2.4.1} Stating; a protected premise is a physical location protection by a fire alarm system and all applicable requirements of the fire alarm regulations.
- **2.8 Alternate Notification** For fire alarm systems installed outside the municipal fire alarm limits, the following shall be an alternate acceptable means of fire department notification:
  - 1. Listed and approved system adaptable to central station service.
  - 2. City contracted alarm-monitoring equipment.
  - 3. Lease line direct to Central Fire Department dispatch center.

- **2.8 Modifications** Additions or modifications to any existing connected system will require approval. If Existing panel or system will not accommodate upgrades, the entire system will need to be replaced.
- **2.9 Key Box System -** Any occupancy installing a fire alarm system shall install a key box approved by the City of Concord. This box will be located adjacent to the master box and remote annunciator. All provisions of the City of Concord, code of Ordinances 26-16 shall apply.

# Section 3 - System Design and Layout

**3.1 Equipment -** Shall be UL listed or FM approved. Specifications shall be submitted for approval prior to installation. If a mixing of manufacturers devices and components is to occur then a statement of compatibility from the manufacturer of the fire alarm control panel shall be required. A statement of compatibility is required for all systems connecting two hard-wired smoke detectors.

#### 3.2 SYSTEMS POWERING AND SUPERVISION:

- **3.2.1** Systems shall operate on DC and be supervised.
- **3.2.2** Systems shall have a separate identifiable AC circuit disconnect provided and be equipped with a breaker lock.
- **3.2.3** Standby batteries shall be provided. These batteries shall:
  - a. be supervised.
  - b. be provided with a supervised charging system.
  - c. be capable of operating the system for sixty {60} hours with a five {5} minute ring down at the end of this period.
  - d. be supported by calculations showing the adequacy of their capacity with respect to system powering.

# 3.3 Control Panel Requirements:

- **3.3.1** Fire Alarm control panels shall be UL listed for fire protection. No combination units will be allowed.
- **3.3.2** Panels shall be red.
- **3.3.3** Panels shall be labeled "FIRE ALARM CONTROL" or equivalent on the outside in white lettering at least one inch in height.
- **3.3.4** The panel upon activation of any alarm device shall:
  - a. sound the evacuation signals
  - b. Flash the evacuation lights (synchronized)
  - c. Indicate the zone of activation
  - d. Trip the master box if required
  - e. Signal the approved central station if required

- **3.3.5** Panels shall not be capable of disconnecting from the municipal alarm system unless they function as a so-called "slave" to a main control panel. For the purposes of this section, a "slave" is a sub panel in a building, which is connected to a main panel in a detached separate building.
- **3.3.6** Panels shall provided zone-indicating lamps, which are red for alarm indication and yellow for trouble indication.
- **3.3.7** Panel power indicating lamps shall be green.
- **3.3.8** Panels shall be provided with switches as follows:
  - a. A drill switch which will permit fire drills without summoning the fire department. The drill switch shall have a ring back feature to supervise the correct position.
  - b. A system reset switch.
  - c. A trouble silence switch which shall silence the trouble audible signal while the trouble visual remains illuminated. The trouble silence switch shall have a ring back feature to supervise the correct position.
  - d. A System silence switch.
  - e. All zones shall be provided with disconnect switches acceptable to the fire department.
  - f. Drill switches shall be local alarms only (building only).
- **3.3.9** Panels shall be provided with the capability of receiving additional signals from devices to resound the evacuation signals when a system had been "silenced". The system shall reactivate both the audible and visual signals.
- **3.3.10** Panels having zone labeling on an outside door with zone lamps mounted inside the panel shall have additional zone labels inside the panel.
- **3.3.11** Panel locations shall:
  - a. be heated.
  - b. be in an area protected by a smoke detector within 6-feet.
  - c. be approved.
  - d. shall not be more than 50 feet travel distance from the main entrance of the building.
  - e. at the level of exit discharge.

Exception: If all necessary Fire Department features are provided on an alphanumeric remote annunciator panel then location does not have to comply with section d and e.

**3.3.12** Panel key shall be CAT 30.

# 3.4 <u>INSTALLATION AND WIRING</u>

**3.4.1** Installation of equipment shall be in accordance with modern standards of good practice.

#### **3.4.2** System wiring shall:

- a. comply with the National Electrical Code (NFPA 70, Latest Edition)
- b. comply with NFPA 72, Latest Edition
- c. comply with the requirements of NFPA 71, Latest Edition
- d. comply with all other state and local codes
- e. Installed in EMT or metallic conduit unless it is 105 degree C wire, unexposed, seven {7} feet above floor and stapled every eighteen- {18} inches.
- f. not installed exposed

# 3.5 ALARM INITIATING DEVICES

- **3.5.1** Manual pull stations shall be as follows:
  - a. red in color
  - b. labeled "Fire"
  - c. wired electrically first in the circuit
  - d. Located within five {5} feet of all exit ways from each floor.
    - **EXCEPTION:** Multiple manual pull stations with 10 feet of each other on the same floor are not required.
  - e. equipped with a key (CAT 30) to open and reset.
  - f. Not mounted higher than 4 ½ feet above floor level.
- **3.5.2** If installed, automatic fire detection devices shall be located and spaced to manufacturer's specifications and/or in compliance with NFPA 72. (NOTE: All smoke detectors shall be capable of meeting NFPA 72 [Latest Edition], Section 7-3.2.1 regarding sensitivity testing).
- **3.5.3** Smoke detectors installed prior to the installation of the finish floor during construction shall be protected until such installation is complete.
- **3.5.4** Non-system connected devices shall be a color other than red.
- 3.5.5 Alarm initiating devices located in concealed areas shall have remote indicators installed. These remote indicators shall be installed at the alarm panel or in the wall of a common corridor nearest to the device, or as specified by the Code official. The location shall be included in the plan notes.
- **3.5.6** Section 3-5. of NFPA 72 (Latest Edition) shall apply as to the number of devices per circuit.
- **3.5.7** Devices for elevator recall systems shall be system connected.
- 3.5.8 Initiating devices in addressable systems shall have their coded address displayed on the exterior of the device. This shall be in the form of a permanent label with ½ inch white tape with 3/8-inch black letters.

# 3.6 EVACUATION SIGNAL DEVICES

- **3.6.1** All devices shall be as follows:
  - a. Red in color.
  - b. Labeled fire.
  - c. Provided with visual or audible signals.
- **3.6.2** All devices installed shall allow the visual indicators of the device to stay illuminated after the alarm silence switch is operated and shall remain illuminated until the system is reset.

EXCEPTION: Existing Modified Systems.

- **3.6.3** Adequate in number and located, thus assuring the alarm is heard in all occupied areas of the building.
- **3.6.4** Notification appliances shall comply with Chapter 4 of NFPA 72 Latest Edition as to audible characteristics, visible characteristics, spacing and textual audible appliances.
- 3.6.5 A red exterior visual beacon or strobe, located as required by the Code official, shall activate with the notification appliances upon fire alarm activation. An alarm condition (flow) on a sprinkler system shall activate a green exterior beacon or strobe. These devices shall be indicated on the plans as to location and height 13-feet above finished grade. In most cases, the devices shall be located on the side of the building facing a public way, of primary access by the Fire Department. If multiple buildings, tenant spaces or other occupancies are connected to one master box, then the devices located on the building with the alarm activation shall be the only one signaling.
- **3.6.6** All occupancies required to have occupant notification by means of voice message shall utilize a prerecorded message initiated by the fire alarm system. The test of the message shall be approved by the Code official prior to installation or acceptance of the system.
- 3.6.7 All fire alarm signals used to notify building occupants must be in accordance with *ANSI @3.41*, *American National Standard Audible Evacuation Signal*.

# 3.7 ANNUNCIATOR PANELS:

- **3.7.1** Remote annunciation panels shall be provided and located at the main entrance on the exterior of the building and adjacent to the master box. **EXCEPTION:** If the fire alarm control panel is located in such proximity to the main entrance that it would be passed by to enter any portion of the building and is visible through a glass door.
- **3.7.2** Remote annunciators shall be as follows:
  - a. Red in color.
  - b. Indicate system trouble conditions both visually and audibly.
  - c. Labeled in plain English.

- d. Back lit with sufficient brilliance to be seen in direct sunlight.
- e. Adaptable fire alarm systems shall be addressable only.
- f. Mirror main panel.
- g. Same type as main panel (addressable panel with addressable annunciator).
- 3.7.3 Annunciator labeling acceptable to the Code official shall be backlit window lettering or engraved plastic-white on red but in no case "Dymo" type labels, or LCD's. LED's will be acceptable if illuminated with sufficient brilliance to be seen in direct sunlight. These annunciators shall be approved prior to plans submission. All key operated switches must be labeled.
- **3.7.4** Remote annunciators shall have an audible and visual trouble indication, which will show any system trouble and remain illuminated when the trouble silence switch is engaged. A key operated trouble silence switch should be provided. Key type shall be A-135.
- **3.7.5** Remote annunciators shall be supervised or have a lamp test switch provided.
- **3.7.6** Graphic annunciator shall be acceptable if approved in advance.
- **3.7.7** The remote annunciator shall be equipped with key operated switches (keyed A-135) for the purpose of silencing the audible devices.

# 3.8 END OF LINE DEVICES:

**3.8.1** End of the line devices shall be marked as such.

# 3.9 PLANS AND SPECIFICATIONS:

- 3.9.1 A statement as to the scope of work shall be submitted with the plans and specifications. This statement shall detail the proposed type of alarm system (i.e. manual evacuation, total automatic detection, etc.) its mode of operation (alarm sequence) and explanation of wiring classes, styles and components.
- **3.9.2** Submitted plans must be drawn to scale and shall include:
  - a. A floor plan showing:
    - 1. connected and non-connected detection devices
    - 2. evacuation signal devices
    - 3. panel location
    - 4. annunciator location (if required)
    - 5. master box location (if required)
    - 6. Knox box location
    - 7. the proposed use of the building
  - b. A one-line wiring diagram including sprinkler flow and tamper switch connections.

- c. An annunciator detail showing zone labeling.
- **3.9.3** A set of plans indicating Code official approval shall be available at the job site until after completion of the required acceptance test.

# 3.10 ACCEPTANCE TESTS:

- 3.10.1 The installer shall complete and submit to the Code official a certification of completion that states the system has been 100% tested and in compliance with the system specifications and manufacturer's recommendations. The form found in NFPA 72 Section 1-6.2.1 or a form acceptable to the Fire Department shall be used.
- 3.10.2 The Fire Department or Code Administration Division shall schedule an appointment to witness a complete system test within fourteen {14} days of the certification as required in 3.10.1. This test is to be conducted by the installer and/or a representative of the owner. No test will take place on less than 72 hours notice after plan approval.
- 3.10.3 No system will be approved or signed off unless all requirements of these regulations have been met.
- 3.10.4 No acceptance test will be conducted prior to installation of the finished floor and the completion of all construction work.
- 3.10.5 If the panel does not have a "walk-test" feature, the installer and/or representative shall have adequate personnel and communications equipment present to initiate the device, silence the alarm, reset the panel and communicate back to the person initiating the alarm as to what zone activated.
- 3.10.6 No alarm system will be signed-off, approved or connected to the municipal alarm system until the names, home address and phone numbers of at least two individuals representing the building owner or designee are received by the Fire Department. The representatives, upon notification by the Fire Department, shall be able to respond to the building within thirty {30} minutes, per City Ordinance.
- 3.10.7 The owner or designee shall provide keys for placement in the Knox box prior to connection to the municipal system.

# 3.11 SYSTEM MAINTENANCE AND TESTING:

- **3.11.1** Systems shall be properly maintained in good working order.
- 3.11.2 System shall be tested in accordance with frequency and methods as described in Section 7-3 of NFPA 72, Latest Edition. The Fire Department shall be informed of the test prior to its performance. Written documentation as to test results shall be kept on file on the premises and forwarded to the Fire Department.
- **3.11.3** Competent and trained individuals shall complete testing and maintenance.

# 3.12 TYPE OF SYSTEMS REQUIRED:

# **3.12.1** Addressable Systems:

- a. 10 or more automatic devices (system connected), or,
- b. 25 or more system-connected devices total (initiating and supervisory).
- c. High rise structure

**NOTE:** An automatic device is defined as any initiating device other than a manual pull station.

# <u>SECTION 4 - DIRECT CONNECTION TO THE MUNICIPAL SYSTEM:</u>

#### 4.1 MASTER BOXES.

- **4.1.2** All boxes shall be approved.
  - a. Installed at locations listed:
    - 1. On the exterior of the building (**see exceptions below**).
    - 2. Near the main entrance of the building.
    - 3. Accessible year round from a walkway or entranceway.

**EXCEPTION 1 to 4.1.1 a (1)** - If a master box serves multiple buildings, a system of private roads and drives are required to access the property, a pedestal mounted box with remote annunciator shall be located at the entrance to the property, or, at the first road intersection in the development.

**EXCEPTION 2 to 4.1.1 a (1)** - If a master box serves multiple buildings and if access to the development is by a single road, the master box with remote annunciator may be located on the outside of the first building approached providing no roadway intersections have been crossed prior to reaching this annunciator, and the building is not in excess of 35 feet from the curb line.

- **4.1.3** Boxes shall be local energy type only. Shunt type boxes are not approved.
- **4.1.4** Boxes will be completely covered until accepted by the Code official.
- **4.1.5** Used master boxes will not be allowed.
- **4.1.6** All master box keys shall be turned over to the Superintendent of Fire Alarm.

# 4.2 <u>CODE WHEEL AND TIMING:</u>

Code wheels, along with timing information will be given to the installer by the Fire Department after plans have been approved as per Section 3.9.

# 4.3 INDICATOR LAMPS:

An indicator lamp having a red globe equipped with a minimum bulb size of 25 watts (110 volt) shall be provided over the box. Lamp hardware will be approved.

# 4.4 WIRING CONSIDERATIONS:

- **4.4.1** Aerial connections shall be made at a minimum of sixteen {16} feet from center of drop to grade level.
- 4.4.2 A #10 solid ground wire will be run in ½ inch conduit from the master box to the street side of the water service and tagged "Fire Department Connection Do Not Remove".
- **4.4.3** The installer shall provide:
  - a. A suitable solid eye anchor on the building for the aerial connection.
  - b. An approved type lightning arrestor at the point of connection with a #10 solid ground wire run to an acceptable ground.
  - c. Four {4} #14 solid conductors, one white, one black, one green and one red, from the master box via a direct metallic ½" conduit to the point of aerial connection.
  - d. An approved type lightning arrestor and eight {8}-foot ground rod if the service connection is to be via a utility pole riser.
  - e. All material necessary for the connection.
- **4.4.4** The Fire Alarm Superintendent will provide a material list to the contractor after review of the project.
- **4.4.5** The cost for labor for the connection to the municipal system is the responsibility of the owner and due at time of connection. The Fire Alarm Superintendent will provide the contractor with a detailed invoice.
- **4.4.6** Connections shall be in approved [junction boxes] and painted red if containing municipal circuits.
- **4.4.7** All connections shall be on approved terminal strips.
- **4.4.8** Absolutely no connections or disconnection will be made to the municipal fire alarm circuits by other than Fire Department personnel.
- **4.4.9** All extensions of existing municipal Fire Alarm System cable necessary to connect a private system to the municipal system will be installed by the Fire Department with the cost of extension to be born by others.

- **4.4.10** Where an underground service is required, the owner will (provide a 2-inch rigid steel) or schedule 80 PVC conduit and cable from the manhole or pole riser to the master box or an approved pull point location. All conduits, including the sweep below grade, above ground shall be rigid steel for the first ten- {10} feet above grade.
- **4.4.11** All duct cable will be IMSA 20-1 conductor, #14 gauge solid conductors. Direct burial cable will not be allowed.
- **4.4.12** The Fire Alarm/Traffic Superintendent shall be notified (225-8667 or 225-8668) not less than three working days prior to the installation of the cable so that a Department representative may be present to supervise the installation.

# 4.5 **RESPONSIBILITY:**

- **4.5.1** All work on the private side of the master box shall be the responsibility of the installer.
- **4.5.2** The City of Concord assumes no responsibility for the correct operation of internal Fire Alarm Systems.
- **4.5.3** It is the owner's responsibility to maintain his system in proper working condition. The Fire Department reserves the right to disconnect service to the master box at any time for non-compliance with these regulations or in case of system trouble which might endanger the proper operation of the municipal system.
- **4.5.4** It is the responsibility of the Fire Alarm contractor to ensure that the owner of the system is aware of the inspection and testing requirements as well as the annual fee for the connection of the master box to the municipal circuit.

# 4.6 TESTING:

All material shall be made available for test and inspection when required by the Code Official.

# 4.7 ANNUAL FEE:

Shall be billed annually, (as authorized by Code of Ordinances, Section 26-26-10). Term runs from August 1 to July 31. Failure to pay the fee will initiate civil court action.

# **SECTION 5 - SPRINKLER SYSTEMS:**

5.1 INTERCONNECTION - Sprinkler systems shall be connected to the fire alarm systems so that sprinkler activation or trouble will initiate an alarm condition or trouble signal as appropriate. Alarm activation shall also activate a green exterior beacon or strobe.

# 5.2 ZONING AND INDICATING:

- **5.2.1** Buildings shall have separate sprinkler zones where:
  - a. there is more than one riser
  - b. the building has two or more sprinkled levels.
  - c. the building is larger than 10,000 square feet
  - d. the sprinkler system protects 2 or more separate occupancies
  - e. or as required by the Code Official.
- **5.2.2** Where zone flow switches are incorporated in alarm circuitry connected to other detection devices a flow switch located at the sprinkler control shall be separately zoned and indicated so that a sprinkler activation and its location is readily discernible at the annunciator.

# 5.3 WATER SHUT-OFFS:

All control devices shall have tamper switches installed on the riser side and connected to the system alarm circuit.

# 5.4 **LOW PRESSURE SWITCH:**

All sprinkler risers shall have a low-pressure switch installed on the riser side and connected to the system alarm circuit.

# 5.5 FLOW SWITCHES:

All vane flow switches shall have 0 to 60 second retard devices installed and be set at 45 seconds. (Exception: Dry pipe systems shall activate the alarm circuit in no more than 60 seconds).

# **SECTION 6 – SPECIAL AGENT EXTINGUISHING SYSTEMS:**

- 6.1 INTERCONNECTION Special agent extinguishing systems shall be connected to installed fire alarm systems so that activation or trouble will initiate an alarm condition or trouble signal as appropriate.
- 6.2 ZONING Each special agent extinguishing system shall be zoned separately.

# **SECTION 7 - ALARM OPERATIONS:**

- 7.1 FIRE ALARM ACTIVATION Upon activation of the building's fire alarm system. The building occupants shall evacuate the premises.
  - **EXCEPTION:** Those occupancies that have an approved fire/emergency plan or are permitted evacuation to areas of refuge by the Building or Life Safety Code.
- **7.2** ALARM SILENCING It shall not be permissible to silence the alarm prior to the arrival of the Fire Department.

# 7.3 ALARM RESETTING

- **7.3.1** It shall not be permissible to reset the alarm prior to the arrival of the Fire Department. A thorough search of the indicated area will be conducted by the Fire Department.
- **7.3.2** It is the responsibility of the property-owner/lessee to reset the fire alarm after authorization by the Fire Officer in Charge.

# **SECTION 8 – ALARM SYSTEM MAINTENANCE:**

- **8.1** Testing and maintenance shall be in accordance with NFPA 72 Section 7-3.
- **8.2** Repairs of fire alarm systems due to faulty initiating devices shall be corrected within 24 hours.
- **8.3** Notification of completion of repairs shall be to the Fire Alarm Dispatch Office at 603-224-2545.
- 8.4 The master box shall be maintained in good appearance and shall be painted every 5 years. Prior to painting, the Fire Alarm Superintendent should be contacted (225-8667 or 225-8668) as to determine the paint color code.

# **SECTION 9 - PERMITS:**

- **9.1** Fire Prevention Permit required for installation and/or modification of fire alarm/detection/smoke control systems. The permits are administrated through the Code Administration Office at Concord, City Hall, 41 Green St. in Concord.
- **9.2** Electrical Permit required for:
  - a. The 25 watt (110 volt) bulb mounted over master box, and
  - b. The 120 Volt AC connection to the fire alarm control panel.