

# PORT ARTHUR FIRE DEPARTMENT

## FIRE PREVENTION DIVISION

### FIRE ALARM SYSTEMS – DOCUMENTATION AND PLAN SUBMITTAL 9-1-2017

The following guidelines are to be followed when a fire alarm system is installed or modified within the City of Port Arthur. These guidelines are not to be interpreted as containing all data required for proper design, installation, or approval. Complete details for the design and installation of fire alarm systems are found in the referenced standards.

- All fire alarm systems hereafter installed or modified shall conform to the following:
  - 2015 International Building Code
  - 2015 International Fire Code, as amended and adopted by the City of Port Arthur
  - NFPA 72 National Fire Alarm and Signaling Code, 2013 edition.
  - NFPA 70 National Electrical Code, 2014 edition
  - Texas Insurance Code chapter 6002 and Texas Administrative Code: Fire Alarm Rules

#### General Requirements

- Automatic fire alarm systems, or replacements of existing systems, shall provide full coverage and be addressable unless otherwise approved.
- The fire alarm control panel or an annunciator panel is required in the fire riser room and at the main entry unless otherwise approved.
- Systems shall be resettable without any special knowledge or the use of an access code.
- Combination security/fire control panels shall be restricted for use in monitoring only. Combination panels used for this purpose shall provide battery calculations equal to the dedicated fire alarm control panel. Notification shall come from dedicated fire alarm control panels.
- Power supplies shall meet chapter 10.6 of the 2013 edition of NFPA 72
  - Primary power shall be a dedicated circuit with the location of the disconnecting means identified at the control panel.
  - Circuit disconnection means shall be permanently identified in red and labeled "Fire Alarm Circuit" and locked or otherwise secured from unauthorized access.
- All equipment needed for required system functions shall conform to NFPA 72 section 10.6 Power Supplies. This requirement is to include equipment such as modems needed for signal transmission to supervising stations.
- All alarm systems, (new or replacement), shall transmit alarm, supervisory and trouble signals descriptively to the approved central station, remote supervisory station or proprietary supervising station as defined in NFPA 72, with the correct device designation and location of addressable device identification. Alarms shall not be permitted to be transmitted as a General Alarm or Zone condition.

#### Wiring

- All initiating device circuits, and signal line circuits shall be Class "A" with a minimum of 4-foot separation between supply and return circuit conductors
- All notification appliance circuits shall be Class "B"
- The Initiating Device Circuit from an addressable device used to monitor the status of a suppression system may be wired Class B, provided the distance from the addressable device is within 10-feet of the suppression system device.
- Wiring may not be supported by the ceiling grid support wires.
- Suspended wires added to support the fire alarm wiring must be painted red and attached to the above structure and to the ceiling grid.

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#### Devices

- Detectors shall not be installed until after all other construction trades have completed cleanup unless specifically required. Detectors required to be installed during construction shall be cleaned and sensitivity tested before commissioning of the system. (NFPA 72, 17.7.1.11)
- A smoke detector is required over all fire alarm control panels, notification power supplies, and monitoring transmitting equipment. (NFPA 72, 10.4.4)
- Duct detectors shall be supervisory in constantly attended occupancies all other shall initiate an alarm signal. (NFPA 72, 21.7.4 & 21.7.4.1)
- Duct detectors shall be provided with a listed alarm indicator and remote reset switch which is accessible from the floor without a ladder, or have the ability to be reset from the fire alarm panel. (NFPA 72, 23.8.5.4.6.4)
- Tamper switches shall be individually addressed and labeled to match the description that is programmed in the fire alarm control panel. (Example: Tamper 1)
- Where two or more strobes are visible, they shall be synchronized.

#### Fire sprinkler monitoring systems

In addition to all other requirements the following are specifically required of fire sprinkler monitoring systems.

- Fire sprinkler monitoring panel or an annunciator panel is required in the fire riser room
- Fire sprinkler monitoring panel shall be labeled "FIRE SPRINKLER MONITORING PANEL" and any annunciator panel identified.
- Primary power shall be a dedicated circuit that is indicated in red and labeled "Fire sprinkler monitoring circuit". Location of dedicated circuit disconnecting means shall be identified in the panel.
- All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electronically supervised. Exception: fire department hose connection valves
- Water flow switches must activate an alarm within 90 seconds. (2013 NFPA 72, sec.17.12.2)
- Sprinkler and standpipe system water-flow detectors shall be provided for each floor tap to the sprinkler system.
- Manual dry standpipe systems shall be supervised with a minimum of 10 psig and a maximum of 40-psig air pressure with a high/low air supervisory alarm.
- Provide a weatherproof horn strobe as close as practicable to the fire department connection.

#### Completion and System Documentation

- A Texas Department of Insurance installation certificate shall be provided.
- A record of completion in accordance with NFPA 72 verifying that the system has been installed in accordance with the approved plans and specifications shall be provided.
- Operating, testing and maintenance instructions and record drawings ("as-builts") and equipment specifications shall be provided at an approved location and conform with NFPA 72 section 7.7.2 *Document Accessibility*.

#### Inspection & Testing Requirements

The following tests and inspections are required for new installations or modifications of existing systems.

- Rough Wiring/ above ceiling: All fire alarm wiring shall be inspected for proper installation and penetration of any firewalls. Fire alarm wiring shall not be tied to ceiling grid wire. Contact Code Enforcement/Permitting Department for low voltage electrical inspection.
- Initial Acceptance test: Contact Fire Prevention Division at least 48 hours prior to scheduling initial acceptance test.

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- A representative from all fire protection systems interconnected with the alarm system must be present at the time of the acceptance testing unless these components have previously been tested. (sprinkler, vent hood extinguishing, etc.)
- All analog or addressable systems will have all devices pulled and/or activated. The print out must comply with the devices that were pulled.
- Water flow alarms will be tested by opening the inspectors test connection and must activate alarm system within 90 seconds.
- Supervising station must contact Fire Department within 3 minutes of device initiation with proper occupancy address and device identification.
- Verification of class A wiring required by testing device on opened circuit and verification of trouble signal on open circuit required

#### Fire Alarm System Modification Requirements

Documentation for fire alarm system modifications shall follow NFPA 72 section 7.5.6.6 *Revisions*.

- Record of completion should include revision date and as-built documents updated with revision date and modifications made.
- Plan submittal to the Fire Prevention Division is only required for the following modifications:
  - Addition or modification of initiation devices (such as smoke, heat, pulls and water flow switches)
  - Panel replacement only if relocated. (requires acceptance test)
  - Addition of power supply or panel of any type
- Minor fire alarm system modifications (such as adding horn/strobe for fire sprinkler monitoring or expanded notification coverage) do not require plan submittal. Work not requiring plans submittal: Contractors shall install a white service tag indicating location (i.e. Suite #) and scope of work (i.e. "Added horn/strobe").

#### Submittal Requirements

- Plans shall be clear and legible and all sheets shall be in a common and appropriate scale (preferably computer generated). A minimum of three (3) sets of plans and minimum of one (1) set of specifications/cut sheets shall be submitted. Plans shall contain sufficient detail to enable the plan reviewer to accomplish a complete review. Plans that do not conform to the submittal requirements and/or are not clearly legible will be rejected and require a re-submittal. Information contained on submitted plans should conform to NFPA 72 Chapter 7 *Documentation* and Section 907 of the International Fire Code.
- Each submittal shall have a:
  - City of Port Arthur Fire Protection Permit Application
  - A copy of the State of Texas Fire Alarm APS license is required for the designing contractor
  - If System is designed by a PE: A State of Texas Engineers stamp is required on all pages
  - A copy of State of Texas Fire Alarm ACR license is required for the installing company
  - UL certificate for monitoring station
- The following information shall be provided on the plans:
  - "Wet" APS or PE signature and stamp.
  - A. H. J. as the City of Port Arthur.
  - Designed in accordance with the 2015 International Fire Code, 2013 NFPA 72 and 2011 NEC. Simply stating, "conforms to applicable codes" will not be accepted.
  - Title block that contains the following:
    - Business name & address of installation
    - Installing company's name, address, and phone #

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- Licensing information
  - Date Drawn / Drawn by
  - A legend that contains the following: Symbols, descriptions, manufacturer, model number, and quantity for all devices shown on plans
  - Floor plan with intended use of each room.
  - Elevation diagram
  - Device address numbers provided for addressable/analog intelligent systems
  - Provide a “point-to-point” wiring configuration
  - Square footage and scale of diagram or measurements of building
  - Location of doors
  - Location of all air-handling units
  - Show location of all fire sprinkler risers, flow switches, tamper switches, and fire pumps (if equipped)
  - The notification device wiring shall be shown different from the initiating device wiring. When necessary to provide clearly legible drawings, they shall be provided on different separate pages
  - The notes shall clearly indicate that the initiating circuit wiring shall be Class A
  - The riser diagram shall include all devices as they are shown on the plans, or wired. Sequence of Operations in matrix format
  - Scope of work, to include description of work to be performed, whether the building is to have a sprinkler system, and **description of the buildings’ intended use** and any specific hazards protected. The scope of work may be included in specification booklet.
  - Plans should clearly identify the location of devices in second stories or attic spaces. This may be best accomplished by a separate page for these locations.
- Specification booklet shall contain the following:
    - Scope of Work if not on floor plan.
    - Data specifications sheets for all devices and equipment
    - Listing of the system design, operation, and rest functions
    - Specific materials in the specification booklet are to be identified by an arrow or highlighter
    - Battery discharge curves
    - Wire specifications, identification on the gauge and type of wire used
    - Equipment List
    - Contact ID/Address table
    - Type of primary power and secondary power (i.e. size and number of batteries to be provided)
    - Device mounting height diagrams
    - Voltage drop calculations clearly indicating each notification device and wire length
    - Battery calculations including Standby and Alarm