

CARROLLTON FIRE RESCUE

FIRE MARSHAL'S OFFICE



CONSTRUCTION GUIDE - FIRE ALARM SYSTEMS - 2022 Edition

Updated January 2022



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Fire Marshal's Office

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GENERAL FIRE ALARM PERMIT INFORMATION

The goal of the Fire Prevention Division is to assist its customers in understanding our submittal, plan review and inspection process and policies, as they pertain to new construction and finish outs. Familiarity with and adherence to these guidelines can greatly assist you in compliance with local codes, ordinances and inspections.

This guide does not replace, nor supersede any adopted codes and/or ordinances adopted by the City of Carrollton, or determinations and positions of the Fire Chief or Fire Marshal.

To expedite the plan review and inspection processes, please refer to the information listed below:

1. **All permits shall be submitted online through the CityView Portal.**
2. All plan review and inspection process steps must be followed. Deviation from the requirements may result in delays and possible rejection of plans or inspection delays.
 - o ***Conducting any work without an approved permit will result in a double permit fee and potential citations and fines being assessed.***
3. All inspections require a permit and a set of approved plans on the job site.
 - o Failure to have the approved drawings and permit on-site may result in a failed inspection and re-inspection fees.
4. All installations must concur with the approved plans. Any deviation from the approved plans requires a re-submittal to the Fire Prevention Division.
5. The contractor is responsible for ensuring that the system(s) being installed or serviced are in compliance with all current locally adopted codes – including, but not limited to the **2021 International Fire Code (IFC)**, **2021 International Building Code (IBC)**, most current NFPA Standards, and City of Carrollton Amendments.
6. All Fire Alarm permit submittals must include a copy of the Texas Department of Insurance (TDI) license for the alarm company's Certificate of Registration (ACR) and the plan designer's Alarm Planning Superintendent (APS) or TX Licensed Professional Engineer (PE).
7. All submitted plans and calculations must be digitally signed or stamped by a TDI Licensed APS or Texas Licensed Professional Engineer (TX-PE).
8. Any approval issued by the Fire Prevention Division does not release the contractor or property owner from the responsibility of full compliance with all applicable codes and ordinances relating to the construction project.
9. The Fire Inspector will provide documented results after each inspection.

It is the goal of the Fire Prevention Division to complete your plan review within the shortest possible time. **We strive to complete your plan review within fifteen (15) business days from receipt of the plan submittal package.** Please be advised that revisions, changes, or an incomplete submittal package may delay your final plan approval.

FIRE ALARM SYSTEM REQUIREMENTS

*These guidelines are to be followed when a business, facility, or organization proposes to install or modify a fire alarm system within the City of Carrollton. All fire alarm systems for the purposes of this guideline and any other guidelines or requirements of the Fire Department shall conform to the **2021 International Fire Code**, as adopted and amended by City of Carrollton Amendments and most current NFPA 70, NFPA 72 and NFPA 92.*

This guide does not replace, nor supersede any codes and/or ordinances adopted by the City of Carrollton, or determinations and positions of the Fire Marshal's Office.

Plans approved by the City of Carrollton, Fire Marshal's Office, give authorization for construction only. Final approvals are subject to field verification.

General Installation Requirements (New/Replacement/Alterations)

- **All Fire alarm systems, new or replacement shall be addressable**
- Installation or fabrication of the system is prohibited without approved plans and permit.
- All fire department inspection forms, permits and stamped drawings shall be kept in a permit packet on the job site until final inspection.
- Sound and lighting systems shall be provided with an automatic shunt mechanism to disable the circuit to eliminate potential conflict of the notification devices
- All FACP's shall be located at Fire Sprinkler Risers or main entrance only.
 - When the fire alarm control panel is not located at the main entrance, a remote annunciator shall be installed at the main entrance.
- All fire alarm equipment shall be listed for its intended purpose.
- Combination Fire and Burglar alarm panels/systems are prohibited.
- Contractor shall verify that all devices in or connected to the building which are required to be monitored by the FACP are being monitored.
 - To include, but not limited to Access Control Devices, Duct Detectors (existing or new ones that are required to be installed), smoke/heat exhaust etc.

Primary power for FACP & Power Supplies

- Primary power shall be a dedicated circuit, listed on approved building electrical plans.
 - All Fire Alarm related circuits shall have an approved label inside & out
 - Lockout Kits are required on all Fire Alarm related circuits.



Fire Alarm Circuit Requirements

- All fire alarm systems shall be installed in such a manner that the failure of any single initiating device or single open in an initiating circuit conductor will not interfere with the normal operation of other such devices. (Class-A)
- Outgoing and return SLC conductors shall be installed in accordance with NFPA 72 requirements for Class A circuits and shall have a minimum of four feet separation horizontal and one foot vertical between supply and return circuit conductors.
- The initiating device circuit (IDC) from a signaling line circuit interface device may be wired Class B, provided the distance from the interface device to the initiating device is ten feet or less.
- Class-A Notification Circuit (NAC) required in all R-1, R-2, R-3 & R-4 Occupancies

Fire Alarm Control Panel (FACP) and Signals

- The FACP shall be listed and compatible with all devices and capable of delivering all required signals.
- All systems and circuits shall be supervised.
- All alarm systems, new or replacement shall transmit alarm, supervisory and trouble signals descriptively to the approved Central, Remote or Proprietary supervising station as defined by NFPA 72, with the correct device designation and location.
- Alarms and signals shall **not** be permitted to be transmitted as a “General Alarm”, “General Trouble”, “General Supervisory” or: Zone Condition”.
- Fire Alarm Systems shall be re-settable without any special knowledge or access code.
 - Key to reset pull station should be placed inside Knox Box.
- Addressable/analog intelligent systems shall contain a history file of 100 events or more
- Duct detectors shall send a supervisory signal only
- Hard-wired systems shall be zoned by device type (e.g., water flow, smoke) **per floor**.
- Requirements for high-rise (55 ft.) and emergency voice/alarm evacuation shall be found in City of Carrollton Amendments.
- FACP and Power Supplies shall be labeled inside with the Circuit Breaker # & Location

Document Box

- An approved labeled document box shall be installed next to FACP with all construction documents, panel instructions and documents required by IFC & NFPA.
 - The documentation box shall be prominently labeled **FIRE ALARM DOCUMENTS**



Fire Pump Monitoring

- Fire pumps shall be monitored on distinct circuits for:
 - Loss of Power
 - Phase Reversal
 - Fire Pump Running
- Fire Pump Running shall send an Alarm signal to monitoring company so that the Fire Department can respond. **It shall not be a supervisory signal.**

Notification Circuits & Devices

- A single weatherproof horn-strobe (min. 75 candela) shall be provided on the exterior of the building above the Fire Department Connection. This notification device shall:
 - Operate on water flow alarm only
 - Shall be non-silenceable while water is still flowing through fire sprinkler system.
- An adequate number of fire alarm notification devices shall be provided such that a minimum sound level 15 decibels above average ambient will be achieved.
- The interior strobe(s) only shall continue to flash after the panel is silenced on the condition the alarm was a water flow alarm only.
- Notification devices shall be wired from the fire alarm control panel as a latching circuit.
- All valves controlling the water supply for automatic sprinkler systems pumps, tanks, water levels and temperatures, critical air pressure and water-flow switches on all sprinkler systems and standpipe systems, with the exception of fire department hose connections shall be individually electrically supervised by a listed FACP.
- Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in multistory buildings.

High Volume – Low Speed (HVLS) Fans

- Includes all fans with a diameter greater than 7 feet
- The maximum fan diameter is 24 feet
- HVLS fans be centered approximately between four adjacent sprinklers
- The vertical clearance from the fan to the nearest sprinkler deflector must be min 3 feet
- HVLS fans must shutdown (via interlock) immediately upon receiving a waterflow signal in accordance with NFPA 72.

FIRE ALARM - FIRE SPRINKLER MONITORING SYSTEMS

These guidelines are to be followed when a building, or facility, within the City of Carrollton, is provided with an approved, automatic fire sprinkler system that shall be required to be monitored. All fire sprinkler system and fire alarms for the purposes of this guideline and any other guidelines or requirements of the Fire Department shall conform to the **International Fire Code 2021 edition**, as adopted and amended by the City of Carrollton Ordinance and most current NFPA standards.

Fire Alarm - Fire Sprinkler Monitoring System /Operational Guidelines

- **All Fire alarm systems, new or replacement shall be addressable and meet current adopted codes and amendments.**
- All valves controlling the water supply for automatic sprinkler systems pumps, tanks, water levels and temperatures, critical air pressure and water-flow switches on all sprinkler systems and standpipe systems, with the exception of fire department hose connections, shall be electrically supervised by a listed fire alarm control unit.
- Approved supervised indicating control valves shall be provided at the point of connection to the riser and standpipe/hose valve on each floor in multistory buildings.
- Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved UL listed central station, or when approved by the code official, at a constantly attended location.
 - *A copy of the monitoring contract shall be given to the Fire Inspector when requesting an acceptance test. (New System or Ownership Change)*
- A single weatherproof horn-strobe (min. 75 candela) shall be provided on the exterior of the building above the Fire Department Connection (FDC).
- The time delay feature on the waterflow switch switches must be set to a delay of 60 seconds but no more than 90 seconds.
- Initiating Circuits: Waterflow alarms shall be programmed non-silenceable.
- The exterior horn/strobe shall operate on waterflow alarm only.
- Notification Circuits: The exterior notification devices shall be non-silenceable. The interior strobe(s) only shall continue to flash after the panel is silenced on the condition the alarm was a waterflow.
- Duct detectors shall be monitored constantly and programmed as supervisory only.
- Supervisory signals shall be transmitted to the monitoring company.
- Fire pumps shall be monitored on distinct circuits for:
 - Loss of power
 - Phase reversal
 - Pump running
- **Alarms shall *not* be permitted to be transmitted as a “General Alarm” or “Zone” condition.** This information must be in turn, transmitted to the Carrollton 911 Dispatch Center, with correct designation.
- Requirements for high-rise (55 ft.) & emergency voice/alarm evacuation
 - Buildings with a floor used for human occupancy located more than 55 feet above the lowest level of Fire Department vehicle access shall have an automatic smoke detection system, Fire Department communication system and an emergency voice/alarm communication system.

PLAN SUBMITTAL REQUIREMENTS

Plan Submittal Requirements – New System or Upgrade to Existing System

Each submission shall contain a total of 2 PDF documents uploaded through the portal

1. One set of data/spec sheets and all other supporting documentation
2. One set of digitally signed plans (*Plans w/ multiple pages shall be 1 document*)

Each submittal book shall contain the following as one continuous PDF:

- Scope of Work Summary
 - o Installation location, reason for install, type of system and # of devices
 - o Include connections to High Volume – Low Speed (HVLS) Fans (If Applicable)
 - o Include Smoke Removal Systems (If Applicable)
- Copy of company's Texas Department of Insurance ACR License
- Copy of planner's Texas Department of Insurance APS License or TX PE License.
- Listing of the system design, operation and reset functions
- Data specifications sheets for all equipment shall be provided
 - o Specific materials on data sheets shall be identified by arrow or highlighter
 - o Include Lock-Out Kit and Document Box data sheets
- Fire Alarm Control Unit battery curve (to include Standby and Alarm)
- Voltage-drop calculations (Clearly indicate each notification device and wire length)
- Type of primary power and secondary power (size & number of batteries to be provided)
- Wire specifications
- Sign specifications and verbiage for all required signage
 - o FACP Room
 - o Above Annunciator Panel

Plan Size and Clarity:

- Plans shall be clear & legible.
- All sheets shall be in a common and appropriate scale (minimum 1/8" = 1'0").
- Submittals done on electrical, lighting, or other "busy" plans are not acceptable.
- Plans shall contain sufficient detail to enable the plan reviewer to accomplish a complete review.

The following information shall be provided on the plans:

- Site map inset
- North arrow
- Scale with Graphic Representation for reference
- System devices/component locations
 - o Fire alarm control panel (FACP)
 - o Annunciator panel
 - o Notification devices (indicate candela rating)
 - o Smoke and/or Heat Detectors
 - o Fire sprinkler risers, flow & tamper switches & fire pumps (*if equipped*).
 - o Smoke Control Systems (*if equipped*)
- Floor plan with intended use of each room identified
 - o All walls & doors shown
- Riser diagram (shall include all devices as they are shown on the plans or wired)
- Locations of fire alarm primary disconnecting means

- Details of ceiling height and construction
- Device mounting height diagrams
- Location of all air handling units (*Include note if no RTU's are included in scope*)
- Provide a "point-to-point" wiring configuration
- Notification device wiring shall be shown different than the initiating device wiring.
 - o When necessary, they shall be provided on different plan drawings.
- Smoke Control System – Panel Layout (*If applicable*)
- Sequence of Operations in matrix format
- Device Legend & Project Bill of Materials
 - o All devices shown on plans (Remove any symbols not used on plans)
 - o Symbol, device description, manufacturer, model # & quantity for each device
- Contact ID/Address table
- Notes shall identify/indicate the following:
 - o Scope of work
 - o Authority Having Jurisdiction = City of Carrollton
 - o Designed in accordance with the 2021 IFC and NFPA 72 - 2019 Ed.
 - o Duct detectors shall sound supervisory alarm only
 - o Initiating circuit wiring shall be Class A
 - o Primary power shall be a dedicated circuit
 - o Classification of supervising station
 - o Gauge and type of wire used
 - o Type of conduit used (if any)
 - o Weatherproof horn-strobe shall be provided on the exterior of the building above the FDC. This notification device shall: Operate on water flow alarm only and be non-silenceable while water is still flowing through fire sprinkler system.
 - o An approved set of "AS BUILT" plans and other documents required by NFPA and IFC shall be posted at FACP in an approved labeled document box.
 - o Breaker for Fire Alarm Control Panel and all Power Supplies shall be marked with approved kit (see examples in construction guide)
 - o All FACP & Pwr Sup circuits shall have approved breaker locking device installed
 - o Fire Alarm Control Panel and all Power Supplies shall be labeled inside with the Circuit Breaker # and Location
 - o Each riser & other valves shall have their own specific tamper signals
 - o Each riser shall have their own specific water flow signal
 - o TX Fire Marshal's installation certificate shall be filled out & posted at the FACP
- Signature Block shall contain the following:
 - o Name and complete address of the installing company
 - o Company Licensing information (ACR-XXXX)
 - o Designed By / Drawn on date
 - o Digital signature of the APS or Texas Professional Engineer
 - o License Number of Designer (APS-XXXX) or Texas PE License #
- Design Information shall contain the following:
 - o Complete Business Name
 - o Location of the installation
 - o Square Footage
 - o Official occupancy classification per the City of Carrollton (ie: A-2, B/S1, etc)
 - o Occupant Load

Plan Submittal Requirements – Replacing FACP ONLY

Each submission shall contain a total of 1 PDF document uploaded through the portal

1. Scope letter and other required documentation

Each submittal book shall contain the following as one continuous PDF:

- Scope of Work Summary
 - o Installation location
 - o Reason for installation/repair
 - o Type of system and # of devices
 - o Full company info including address, contact name, office #, email address,
 - o State ACR #
 - o APS/PE Electronic Signature in contrasting color.
- Copy of company's Texas Department of Insurance ACR License
- Copy of designer's Texas Department of Insurance APS License or TX PE License.
- Data specifications sheets for all equipment shall be provided
 - o Specific materials on data sheets shall be identified by arrow or highlighter
- Include Lock-Out Kit and Document Box data sheets
 - o Existing power supply units must have lock-out kits
 - o If approved document box is not present, one must be installed
- Fire Alarm Control Unit battery calculations (to include Standby and Alarm)
- Voltage-drop calculations (Clearly indicate each notification device and wire length)
- Type of primary power and secondary power (size & number of batteries to be provided)
- Listing of the system design, operation and reset functions
- Point ID/Addressable device table.
 - o (Shall indicate how the devices will report to the monitoring company.)

Plan Submittal Requirements – Replace/Upgrade Dialer ONLY

Each submission shall contain a total of 1 PDF document uploaded through the portal

1. Scope letter and other required documentation

Each submittal book shall contain the following as one continuous PDF:

- Scope of Work Summary
 - o Installation location
 - o Reason for installation/repair
 - o Type of system
 - o Full company info including address, contact name, office #, email address,
 - o State ACR #
 - o APS Signature
- Copy of company's Texas Department of Insurance ACR License
- Copy of designer's Texas Department of Insurance APS License or TX PE License.
- Data specifications sheets for all equipment shall be provided
 - o Specific materials on data sheets shall be identified by arrow or highlighter
- Include Lock-Out Kit and Document Box data sheets
 - o Existing power supply units must have lock-out kits
 - o If approved document box is not present, one must be installed

INSPECTION REQUESTS AND PROCEDURES

The following guidelines shall be used when requesting an inspection:

- All inspection requests shall be coordinated by contacting the inspector on your permit.
- **Contact your inspector at least 48 hours in advance of the requested inspection.**
- **Note: Due to limited staffing, your requested inspection may need to be scheduled more than 48 hours out.**

All inspection requests shall be submitted in the following format:

Subject Line of e-mail shall contain:

- o Type of inspection Request- Address of installation - Permit #
- o (i.e., Hydro/Visual Inspection Request – 1234 Any Street – Permit #202101120)

Body of e-mail shall contain:

- o Name, complete address, phone number and e-mail of installing company
- o Name, cell number and e-mail of on-site representative
- o New or Replacement Cellular/Radio Communicator installations require a minimum 7-day continuous signal test
 - No dropped signals allowed
 - Include a PDF copy of the report with your inspection request
- o Copy of system test from central monitoring station with all devices listed
- o Photo proof of all required signage
 - FACP Sign (if not co-located with Fire Riser)
 - Sign above annunciator panel with directions to FACP
- o Photo proof of installed approved, labeled document box
 - If current Document Box is full, then an additional box must be installed.
- o Photo proof of installed Knox Box
 - Knox Box 3200 Series required for all single tenant buildings
 - Knox Vault 4400 Series (single lock) required for all multiple tenant buildings.
- o A copy of the fire alarm monitoring contract or e-mail confirmation from alarm company

On-Site Requirements:

- A representative of the requesting company must be present at time of inspection who can effectively communicate and answer questions of Fire Inspector.
- City of Carrollton Fire Marshal's Office approved, stamped, and signed plans and permits must be kept on the job site and presented to the inspector prior to beginning.
 - o **** Contractor shop drawings are not considered approved plans. ****