

FIRE ALARM SYSTEMS INFORMATION PACKET



City of Stillwater
Development Services

Building Safety Division
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PURPOSE

This information packet has been developed in an effort to provide the highest level of service to the customers of the City of Stillwater. The intent of automatic fire sprinkler plan reviews is to ensure the design of automatic fire sprinkler systems meet the minimum requirements of the adopted codes and ordinances. To meet this intent, the submitted plans and supporting documentation must contain the information needed to conduct a thorough review.

SCOPE

This packet outlines the requirements set forth in the International Fire Code, local amendments, departmental policies and NFPA 72 as they relate to the installation fire alarm systems. This packet is not intended to provide an all-inclusive listing of submittals and inspection requirements, as it would be virtually impossible to cover all situations. Also included in this packet is information covering items required to be included on the working drawings and supporting documents.

DEFINITIONS

COS	City of Stillwater
NFPA	National Fire Protection Association
IFC	International Fire Code
FACP	Fire Alarm Control Panel
FSA	Fire System Annunciator

GUIDELINES

I. INTRODUCTION

A. APPLICABLE CODES AND STANDARDS.

1. 2003 International Fire Code and local Amendments.
2. 1999 NFPA 72 National Fire Alarm Code.
3. 2005 NFPA 70 National Electrical Code.
4. Stillwater City Ordinances.
5. Administrative Rulings and Interpretations.

B. ADMINISTRATIVE REQUIREMENTS.

1. **Code/Standard Editions.** Fire alarm systems shall meet the criteria of the 2003 IFC as amended and all applicable requirements of the referenced NFPA standards. Fire alarm systems shall also meet the requirements set forth in adopted ordinances and COS administrative rulings.

2. **Permits/Inspections.** Required plan submittal with approvals, permits and associated inspection must be secured through the COS Development Services Department
3. **Special Circumstances.** Depending on the scope of work, different types of submittals may be required; therefore you may want to contact the COS fire protection specialist for any additional information. For example, a performance based installation must be substantiated with documentation such as fire models with scenarios chosen by the Fire Code Official and/or documentation from an independent testing agency or manufacturer supporting the proposed design.
4. **Alternative Methods.** If special building conditions and/or restrictions existing that may prohibit any of the requirements set forth in this packet from being met, approval by the COS fire protection specialist for an alternate installation will be required. This alternate method must be approved before any installation of the system begins.
5. **Non-Required Systems.** All non-required fire alarm systems shall meet the requirements of all applicable standards (NFPA 72 3-2.4).

II. SUBMITTAL INFORMATION

Submittals shall be of sufficient clarity and quality to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of the IFC, and other relevant laws, ordinances, rules and regulations adopted by COS, and as determined by the Building Official. You may refer to the attachments section of this packet for a more complete checklist of items required to be provided on the submitted plans.

A. MINIMUM REQUIREMENTS FOR SUBMITTAL.

1. **Drawing Size.** Drawings shall be submitted on sheets no less than 24x36 inches and shall be drawn to $\frac{1}{8}$ " or $\frac{1}{4}$ " scale. Other scales may be accepted on an as-needed basis, please contact COS if you have questions regarding the use of different scales.
2. **Number of Drawing Sets.** A minimum of 2 sets of fire alarm plans shall be submitted and include the items found in the checklist provided within this packet. Drawings shall include the information indicated in the Plan Requirements Checklist located at the back of this packet. Please roll the plans, as this method is more appropriate for our plan bins and easier to transport within the office. A maximum of 3 original sets may be stamped with our approval.
3. **Cut Sheets/Specifications.** One set of the manufactures product information (cut sheets) shall be provided. This is to include the information on all devices that are part of, or being connected to, the fire alarm system. Any cut sheets showing multiple models/type of devices, the specific item being installed shall be highlighted. As an example, the use of multi-candela horn/strobes shall have the specific model number highlighted and the current draws associated with that model and candela rating highlighted.
4. **Secondary Power Calculations (Battery Calculations).** A minimum of 1 set of the secondary power (battery) calculations shall be provided for all power supplies being installed within the system. This is to include the voltage and amperage information on all batteries being installed within the main panel and any supplemental power panels being provided. Battery calculations shall include the following information:
 - a. Standby and Alarm current draws for each device/appliance connected to the fire alarm system.
 - b. The Model number of each device/appliance.
 - c. Description of each device/appliance.

- d. Standby time (i.e. 24 hours, 60 hours, etc.)
 - e. Alarm time (i.e. 5 minutes, 15 minutes, etc.)
 - f. Total current draw of the system.
 - g. Battery size and whether wired series or parallel.
5. **Voltage Drop Calculations.** Two sets of voltage drop calculations shall be submitted with the plans. These calculations are to include the following information:
- a. The total number of devices on each wiring circuit.
 - b. The current draw of each device.
 - c. The maximum length of wire utilized on each circuit.
 - d. The wire size being used.
 - e. The voltage remaining at the last device.
 - f. Intelligent Horn/Strobes must show the manufactures information of how the voltage drops shall be calculated.
 - g. Adjustable Multi-Candela Horn/Strobes - the battery calculations shall be calculated according to the candela rating on the fire alarm plans. For example, if the fire alarm plans indicate the candela rating is 110, the battery calculation shall calculate for a 110 candela.
6. **Sequence of Operations.** The sequence of operation of the fire alarm system shall be provided in matrix format. A sample can be found in NFPA 72 Figure A-7-5-2.2(9).

III. GENERAL INFORMATION AND REQUIREMENTS

A. FACPs.

1. The fire alarm control panel shall be located at the main entrance to the building. Where the fire alarm control panel is not visible from the main entrance, a remote annunciator shall be located within ten (10) feet of the main entrance and a sign provided to identify the main panel location.
2. A Knox Box shall be provided on the exterior of all buildings provided with a monitored fire protection system per IFC 506.1. The Knox Box shall be near the main entrance. Information concerning the ordering and mounting the Knox Box may be obtained by contacting the Development Services Office.

B. ZONED SYSTEMS.

1. Each floor of a multi-floor building shall be zoned separately.
2. Manual and automatic initiation devices located within the same fire zone or floor may be wired on the same zone. Duct detectors shall be zoned separately from manual and automatic devices.

C. MONITORING.

1. In accordance with IFC 907.15, all fire alarm system shall be monitored by an approved supervising station. COS considers all UL listed or FM approved central, remote or proprietary supervising stations as approved supervising stations.

D. SIGNAGE.

1. Approved signage must be provided on the door of the enclosure in which any fire alarm control panels are located stating "Fire Alarm Control Panel" in 2-inch high block letters with a stroke of not less than 1/4-inch and a color contrasting with its background.
2. Signs shall be permanent, weatherproof and appropriately secured.

E. DUCT DETECTORS AND SMOKE DAMPER DETECTORS.

Duct detectors required by the provisions of the 2003 International Mechanical Code shall be connected to the building fire alarm system, where provided, in accordance with the requirements of NFPA 72. Duct detectors shall **not** initiate a general alarm signal; they shall initiate a supervisory signal only. Duct detectors are not required to be connected to a water flow alarm system.

If the fire alarm panel is monitoring smoke damper detectors, the smoke damper detectors shall initiate a supervisory signal not a general alarm signal.

F. FACP REPLACEMENT/RELOCATION.

Control panel replacements and relocations may take place under a letter. COS will reacceptance test the system and a permit fee will be collected.

G. TENANT FINISHES/ADDITIONS.

1. **Audible.** COS will allow the new addition or the tenant finish to be the same tone as the existing audible devices, in lieu of 3-pulse temporal when the existing horns do not sound as 3-pulse temporal.
2. **Visual.** The new strobe devices are required to be synchronized amongst each other. The new strobe devices do not have to be synchronized with existing strobe devices, unless there are more than two visible notification appliances in the same room or adjacent space within the field of view (NFPA 72:4-4.4.1.1).
3. If the work consists of 5 devices or fewer, the work may be submitted to COS on a 5-device letter.

IV. ADDITIONAL SYSTEMS

A. Elevators/Elevator Recall (NFPA 72:6.16.3).

Elevator recall and firefighter control shall be in accordance with the International Building Code, International Fire Code, and NFPA 72 (as adopted by reference).

The Building Safety Division shall be notified and must witness acceptance testing of all elevators.

Elevators shall be provided with a two-way communication system. This system must be constantly connected to an attended location or a U.L. listed monitoring station.

B. WATER FLOW ALARM SYSTEMS.

In accordance with the IFC section 903.4, all valves controlling the water supply for automatic sprinkler systems and water-flow switches on all sprinkler systems shall be electrically monitored where the number of sprinklers exceeds 20 for all occupancies. There are exceptions to this, please refer to the 2003 IFC and local amendments for these exceptions.

COS requires the "fire alarm control panel" or an annunciator, an interior horn/strobe, and a manual pull station in a normally occupied location i.e. customer service desk, cash register area, etc.

Buildings intended to serve more than one tenant need not be equipped with an audible and visual sprinkler flow alarm on the interior of the building to alert occupants provided an alarm system is not required by other code provisions per IFC 903.4.2.1. Additionally, a pull station is not required for buildings intended to serve more than one tenant.

There must be an exterior horn/strobe within 20 feet of the FDC. The exterior horn/strobe shall activate upon a water flow alarm only, and de-activate when the water flow stops. No other devices are required to be monitored by a water flow alarm system.

The intent of the water flow alarm system is merely to monitor the status of the suppression systems. Thus duct detectors are not required to be tied into these systems. No form of general notification or evacuation is intended by a water flow alarm system.

C. COMBINATION FIRE/BURGLARY SYSTEMS (NFPA 72:3-8.2).

Combination fire/burglar system control unit shall be listed for their intended use.

Short and open circuits, ground faults in fire and non-fire alarm equipment shall not interfere with the monitoring for integrity of the fire alarm system or prevent alarm, supervisory or fire safety control signal transmissions. Ground faults shall at least indicate a trouble signal, even if the panel is not capable of specifying the trouble.

Fire Alarm signals shall be distinctive, clearly recognizable and take precedence over any other signal, even if the non-fire alarm system was initiated first. The monitoring company must be able to distinguish between fire and burglar alarms, as well as the panel. It cannot come in as a burglar alarm when it is a fire alarm and vice versa.

D. SPECIAL HAZARD EXTINGUISHING SYSTEMS.

Dry/wet chemical, carbon dioxide, halon, clean agent systems shall be connected to the building fire alarm system, if provided, in accordance with the requirements of NFPA 72, such that the actuation of the extinguishing system will sound the fire alarm as well as provide the function of the extinguishing system. (Reference NFPA standard applicable to the type of system).

E. VOICE EVACUATION SYSTEMS AND FIRE COMMAND CENTERS.

Speakers used as alarm notification appliances on fire alarm system are also permitted to be used for non-emergency purposes provided that the requirements of NFPA 72 3-8.2.4 are met.

V. INSTALLATION

A. PERMITS.

1. The installation of the fire alarm system is not to commence, including any pre-wiring, until the working plans have been reviewed and approved by COS and an installation permit secured on site, per IFC 105.1.4.

B. PERMISSIBLE OMISSIONS.

1. **Multi-Tenant Buildings.** A pull station is not required to be provided in strip mall type buildings.
2. **Apartment Buildings with Breezeways.** A pull station is not required to be provided in exterior corridors (breezeways) of apartment buildings.

VI. INSPECTION AND TESTING

A. INSPECTION.

It shall be the duty of the person doing the work authorized by a permit to notify the COS that the work is ready for inspection. It shall also be the responsibility of the person requesting the inspections to provide access to and means for proper inspection of the work, per IFC 106.5.

1. Visual.
 - a. Fire alarm detection and notification devices shall be visually inspected for proper location and installation in accordance with NFPA 72:7-1.6

B. TESTING.

2. Notification appliances and circuits, alarm- supervisory- and trouble-initiating devices and circuits, primary and secondary power supplies, shall be tested in accordance with NFPA 72 per IFC 901.17.
3. A full operational pre-test of the fire alarm system shall be performed prior to the scheduled fire inspection.
4. A/C Power Loss and delays on reporting. If there are any delays in reporting A/C power loss, this time delay must be accounted for. Either the panel must be programmed to a zero delay for inspection purposes or the A/C must be disconnected PRIOR to the inspection, so the signal will be sent during the inspection. The disconnection time must be recorded.
5. Phone lines are required to be provided for final testing.

C. COMPLETION DOCUMENTS.

1. The completed *Fire Alarm System Record of Completion* form is to be provided to the inspector at the time of inspection. This form is located on pages 72-27 through 72-30 of NFPA 72.

D. MODIFICATIONS TO EXISTING SYSTEMS.

1. When any initiating device, notification appliance or control relay is added, it shall be functionally tested.
2. If any of the above is deleted, another item of the same description on the circuit shall be tested
3. When any modification to the control equipment is made, the control equipment shall be tested in accordance with NFPA 72:7-1.6.

Plan Requirements Per COS, NFPA 72 and IFC.

Title Block shall contain the following:

- Name of owner and occupant.
- Location including full street address and suite or unit numbers.
- Name, address, phone, FAX number and email address of installing contractor and designer.
- Signature/seal that these drawings were reviewed by a person holding a NICET level III or IV certification in Fire Alarm Systems or State of Oklahoma Professional Engineering license certification.
- Point of Compass on every page.
- A scale including graphic representation.
- Detailed scope of work.
- A list of the codes, including the edition dates, that were used to design the fire alarm system.
- Type of fire alarm system – zoned, addressable, intelligent.
- Name, address and type (central, remote, proprietary) of monitoring agency.

Information required on Drawings:

Building Information:

- Ceiling height and construction details.
- Building construction type and occupancy classification. If Multi-use, note separate occupancy classifications on the layout or key plan.
- Building elevation detail/view.

System Information:

- Device Legend to include: Make, model, temperature rating if applicable, candela rating if applicable.
- Wiring Legend to include: Wire type and size.
- Complete riser detail.

- All addressable fire alarm systems are to provide a listing of the addresses being used on each indicating device. This information is to include the device identification number, type of device, location of the device and the location description to be displayed at the FCP.
- A zoned fire alarm system shall include the zone identification of each zone to be displayed at the FCP. In addition, a listing of the zones shall be included.
- Power Connection.
- Battery calculations.
- Voltage Drop calculations.
- Interface of fire safety functions.
- Intended areas of coverage.
- Sequence of operations – matrix format.

Plan Information:

- Site Plan – new construction.
- Floor plan indicating use of all rooms.
- Location of Alarm control and trouble signaling equipment.
- Location of Annunciation.
- Location of FDC location of alarm bells (exterior horn/strobe).
- Location and details of all tamper switches, control relays, etc.
- The location of all elevators and elevator equipment rooms shall be indicated. (Refer to section IV of this).
- The location of system duct smoke detectors shall be indicated. This information is to include the location of the remote test switch, when the remote test switch is required.
- Rated corridors and/or area separation walls shall be indicated on the plans. Location of partitions, fire walls and /or area separation walls and rating classifications.
- The location of all electromagnetic door holders and the smoke detectors that release those electromagnetic doors shall be shown. The ceiling elevation on either side of these doors must be indicated on the plans.
- Locations of all initiating devices shall be shown on the plans. This information is to include point-to-point-wiring and the address or zone of the device. On intelligent systems, the address of the device shall be placed next to the device on the plans. On zone systems, the zone circuit shall be identified on the plans next to the device.
- The locations of all system notification appliances shall be provided. Include the point-to-point-wiring and the circuit number between devices on the plans. The candela rating of each device shall be indicated on the plans next to the device.

- For addressable notification circuits, provide the full address for each device next to the device on the plans.
- When a new system is an addition to an existing system, enough of the old system shall be indicated to make all conditions clear.
- Manufacturer's Product Data.

Public Accessible/Common Use Rooms requiring notification devices

Examples of rooms requiring notification devices include, but are not limited to:

- Reception Lobbies
- Waiting Lobby/area
- Conference/meeting rooms
- Corridors for public areas
- Restrooms
- Elevator Lobbies
- School Office Areas
- School health/nurse rooms
- Places of assembly:
 - ⇒ Theater, Auditorium, Gymnasium etc.
- Classrooms
- Accessible Rooms
 - ⇒ Hotels
 - ⇒ Handicap & Hearing Impaired rooms etc.
- Counselor offices
- Locker/shower rooms
- Indoor Pool Areas
- Public Hotel Laundry Rooms
- Break/lunch rooms
- Dining/cafeteria rooms
- Sales floors/customer areas
- Music Practice Rooms
- Work room/office space greater than 100 sq ft.
- Libraries
- Mechanical/electrical/data/phone/utility rooms greater than 300 sq ft.
- Medical exam/treatment/patient care rooms
- Copy/mail rooms greater than 100 sq ft.
- Dressing rooms
- Open work areas greater than 100 sq ft.



APPLICATION FOR PLAN REVIEW

Date _____ First Submittal Re-Submittal

Project Name: _____

Project Address: _____

Indicate Plan Type:

- Automatic Sprinklers
 - 40+ heads
 - 20-40 heads
 - Less than 20 heads
 - Underground **Only**
- Fire Alarm/Detection System
 - < 10 initiating or 5 notification devices
 - > 10 initiating or 5 notification devices
- Liquid Storage Tanks
- Smoke Removal
- Central Station Monitoring
- Revisions
- As-Built
- Other _____

Submitting Contractor:

Company Name: _____ Contact: _____

Phone: _____ Fax: _____

Additional Information:

- **Three (3)** sets of plans, 1/8" scale, and **One (1)** submittal/specification book and fire alarm or hydraulic calculations will be required.
- Submit all blue/black lines rolled. All calculations/submittals must be flat.
- **Maximum** size of prints is size "E". **For underground only:** 24 inches x 36 inches
- Contact person will be notified upon **completion** of plan review
- Liquid storage tank permits and burn permits must be applied for at the Fire Marshal's Office.

Stillwater Building Safety Division Only
 A ___ R ___ Working Days ___ Reviewed By _____ Date _____

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