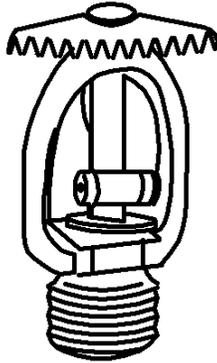


VENTURA CITY FIRE DEPARTMENT

Fire Prevention Division



Automatic Fire Sprinkler Handbook

Plan Review Status 805-677-3941
Inspection Scheduling 805-658-4717

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David Endaya, Fire Chief

Ventura City Fire Department

Fire Prevention Division

Automatic Fire Sprinkler Handbook

Introduction

Since November 1991 the City of Ventura has required the installation of automatic fire sprinklers in virtually every new building and created thresholds that require existing buildings to be retrofitted with automatic fire sprinkler protection. The City of Ventura currently has adopted the 2013 California Fire Code (CFC) with local amendments. Within the CFC, the 2013 editions of NFPA 13, 13R, and 13D have also been adopted with California amendments. The State has also adopted the 2013 California Residential Code (CRC) with provisions for the design and installation of automatic fire sprinklers in all new single-family residences, duplexes, and townhouses.

Plan Submittals

Automatic fire sprinkler system plans are required to be reviewed and approved by the Fire Department prior to the installation of new systems or any alteration to existing systems¹. Plan submittals shall be approved and permits obtained prior to any work commencing. Emergency repairs may conditionally proceed prior to the issuance of a permit provided that Fire Prevention is notified at 805-658-4717 within 24 hours of the repair work starting, and all permits are obtained within 72 hours.

Working plans for commercial or residential, new systems or alterations shall include all items applicable as listed in NFPA 13, Section 22.1.3.

Hydraulic calculations are required on all new systems and any system that has a change in design density, or the building has been modified and the hydraulically most remote area of the building has changed.

Three (3) sets of plans (minimum paper size is 18" x 24"), one (1) set of hydraulic calculations (if required), and one (1) set of manufacture data sheets shall be submitted to **City of Ventura, City Hall, Building & Safety Division, 501 Poli Street, Room 117, Ventura, CA 93001**. Plan counter hours are as follows: Monday, Tuesday, Wednesday, Friday 7:30 am to 4:30 pm and Thursday 9:00 am to 4:30 pm. City Hall is closed alternating Fridays (go to www.cityofventura.net for closure dates). Plans must be submitted in person. The person holding the California contractor's license shall pick up the plans and sign for permits unless an agent authorization letter (on company letterhead) has been submitted to Building & Safety.

It is the goal of the Ventura City Fire Department to review and return plans within 14 calendar days of the plans being submitted or re-submitted. After the 14 calendar days, the status of the plan review may be checked by calling 805-677-3941. You will be contacted within 24 hours with the status.

¹ **“New systems”** include fire sprinkler installation in an existing structure. An example of **“alterations”** include the relocation of a single fire sprinkler head.

Required Inspections

Automatic fire sprinkler system inspection requests shall be made by calling **805-658-4717**. A representative from the installing company shall be present at all inspections.

Commercial fire sprinkler system (new):

- Underground rough & hydrostatic test (thrust blocks and bells shall be visible during rough inspection)
- Underground flush
- Above ground rough & hydrostatic test (all piping shall be visible for inspection)
- Above ground final

Commercial fire sprinkler system (alteration):

- Above ground rough & hydrostatic test (all new piping shall be visible for inspection)
- Above ground final

** Commercial includes residential buildings with 3 or more dwelling units

Residential fire sprinkler system (new):

- Above ground rough & bucket test (all piping shall be visible for inspection and rough will not be signed off on building permit without a passed bucket test)
- Above ground final

Residential fire sprinkler system (alteration):

- Above ground rough (all new piping shall be visible for inspection)
- Above ground final

City of Ventura's Local Requirements

Fire Sprinkler Affidavit

As part of the plan check process for building additions or remodels, the City of Ventura requires all commercial and residential property owners to complete a Fire Sprinkler Affidavit. The affidavit assists in determining when fire sprinkler retrofit is required. A copy of the Fire Sprinkler Affidavit can be found in Appendix A.

Residential Water Meters/Risers

New residential fire sprinkler systems shall share a single water meter with the domestic water supply. A single spring loaded rubber faced check valve is required on the fire sprinkler system riser. No control valves shall be installed that isolate the automatic fire sprinkler system from the water supply unless the domestic system is also isolated with the same control valve. No "U-branch" or other separate meter designs will be accepted for new residential fire sprinkler systems.

Mixed Use Buildings

New buildings designed to be utilized for both residential and commercial occupancies shall have an automatic fire sprinkler system designed to meet all requirements of NFPA 13.

Backflow Prevention

All automatic fire sprinkler systems shall have backflow prevention as required by the City of Ventura Water Department and the City of Ventura Public Works' Engineering Division. Copies of these standards can be found at www.cityofventura.net.

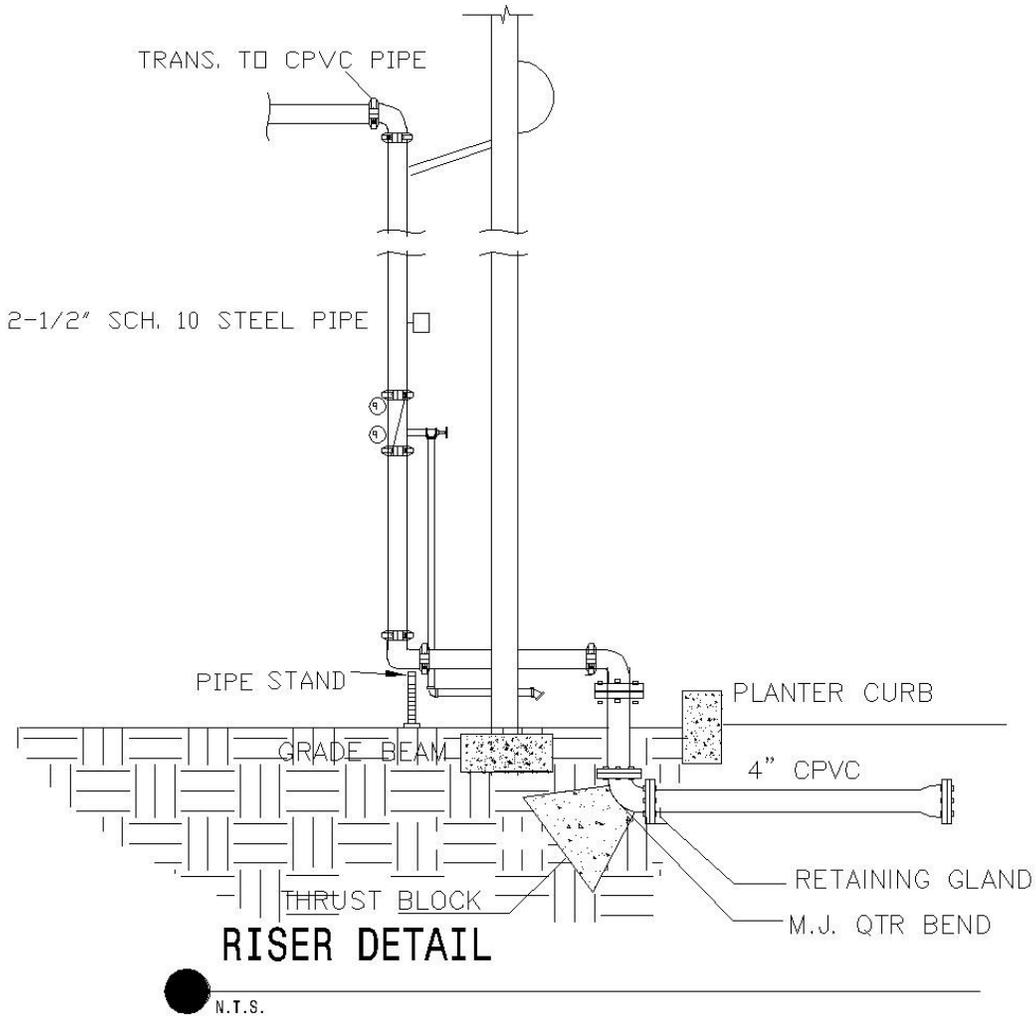
Drop Out Ceiling Tiles

"Dropout" T-bar ceiling tiles shall NOT be used in lieu of required sprinkler coverage.

Commercial Fire Sprinkler System Risers

Varying degrees of electrolysis occur in the soil throughout Ventura. Due to this and other factors, automatic fire sprinkler system underground piping has a tendency to fail at or near the building footprint when the piping penetrates the building's footings and/or foundation. New commercial fire sprinkler system shall not extend into the area of the building's footprint unless the stainless steel piping is installed from five (5) feet outside of the footprint and extending to the interior of the building without fittings under the foundation. Fire sprinkler risers may be located on the exterior of the building or may penetrate the structure above grade. When an existing system has an underground pipe failure under the footprint of the structure, the new pipe shall meet the above conditions.

Example non-stainless steel installation:



NFPA 13 System Requirements

NFPA 13 has incurred some significant changes during the past two code cycles. Below are some of the more common changes that must be addressed in plan review and/or installation.

Owner Literature

The installing contractor shall provide the property owner or the property owner's authorized representative with the following:

- (1) All literature and instructions provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed
- (2) NFPA 25, *Standard for the Inspection, testing, and maintenance of Water-Based Fire Protection Systems, 2006 California Edition*
- (3) *California Code of Regulations, Title 19, Chapter 5, "Fire Extinguishing Systems."*

General Information/Riser Sign

The riser sign shall include all the following information:

- Name and location of the facility protected
- Occupancy Classification
- Required flow and pressure of the system at the base of the riser
- Presence of high-piled and/or rack storage
- Maximum height of storage planned
- Aisle width planned
- Required flow and pressure of the system at the water supply source
- Required flow and pressure of the system at the discharge side of the fire pump where a fire pump is installed
- Type or types and number of sprinklers or nozzles installed including the orifice size, temperature rating, orientation, K-Factor, sprinkler identification number (SIN) for sprinkler heads when applicable, and response type
- The minimum discharge flow rate and pressure required from the hydraulically most demanding sprinkler
- The required pressure settings for pressure reducing valves
- For deluge sprinkler systems, the required flow and pressure at the hydraulically most demanding sprinkler or nozzle
- The protection area per sprinkler based on the hydraulic calculations
- The edition of NFPA 13 to which the system was designed and installed

Spare Sprinkler List

A list of the sprinklers installed on the property shall be posted in the sprinkler cabinet. The list shall include the following:

- Sprinkler Identification Number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating
- General description
- Quantity of each type to be contained in the cabinet
- Issue or revision date of the list

Flexible Sprinkler Hose

Where flexible sprinkler hose fittings are installed, a label limiting relocation of the sprinkler shall be provided on the anchoring component. If flexible sprinkler hoses are proposed to be added to an existing automatic fire sprinkler system, hydraulic calculations shall be submitted to confirm that the system continues to meet minimum water flow and pressure requirements.

NFPA 13R System Requirements

HVAC Protection

Automatic fire sprinklers shall be installed in closets or areas used for heating and air-conditioning equipment.

NFPA 13D System Requirements

Ceiling Fan Obstructions

Pendent sprinklers shall be located at least 3' away from obstructions such as ceiling fans and light fixtures.

HVAC Protection

Automatic fire sprinklers shall be installed in any closet used for heating and air-conditioning equipment.

Garage Protection

Attached garages shall be protected by quick response or residential automatic fire sprinklers.

California Fire Code Requirements (CFC)

Floor Control Valves

Floor control valves and waterflow detection assemblies shall be installed at each floor where any of the following applies:

1. Buildings where the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access
2. Buildings that are four or more stories in height
3. Buildings that are two or more stories below the highest level of fire department vehicle access

California Residential Code Requirements (CRC)

The CRC applies to all single family residences, duplexes, and townhouses.

Domestic Demand

Where a water supply serves both domestic and fire sprinkler systems, 5 gpm shall be added to the sprinkler system demand at the point where the systems are connected. This flow must be included during bucket flow tests.

Duplex/Granny Flat/Townhouse systems

Piping beyond the service valve located at the beginning of the water distribution system shall not serve more than one dwelling.

General Requirements

Owner/Builder Designed Systems

The installation of a fire protection system, excluding an electrical alarm system, shall be performed only by:

- a contractor holding a California fire protection contractor classification (C-16), or
- a properly licensed professional engineer, or
- by an owner-builder of an owner-occupied, single-family dwelling, provided not more than two single-family dwellings on the same parcel are constructed within one year.

Note: A system designed by a C-16 contractor can only be installed by that designing contractor.

Appendix A – Fire Sprinkler Affidavit

Fire Sprinkler Retrofit Worksheet

Site Address: _____

Plan Check #: _____

The City of Ventura automatic fire sprinkler retrofit program is intended to promote fire and life-safety equitably across all types of occupancies and classes of construction through mandatory retrofitting of automatic fire sprinkler systems. This mandatory retrofitting of automatic fire sprinklers is required in existing occupancies when the following thresholds or criteria is met.

In order for your building permit application to be deemed “complete”, this worksheet must be completed.

(Check One)

Residential Project
(Complete Part 1)

Commercial Project
(Complete Part 2)

Part 1 (Residential Projects)

A. Increased Size

- _____ Sq. Ft.
- 1. November 6, 1991 legal/recorded building area _____ Sq. Ft.
- _____ Sq. Ft.
- (Include attached garage) _____ Sq. Ft.
- _____ %
- 2. Building area added since November 6, 1991
- 3. Proposed additional building area
- 4. Add Line 2 and Line 3
- 5. (Divide Line 4 by Line 1) x 100
- 6. If Line 5 equals 100% or more, then the entire structure must be retrofitted with an NFPA 13D automatic fire sprinkler system. Separate permits for the automatic fire sprinkler system and any water meter upgrades will be required.

B. Ceiling Area

- 1. Current building area including attached garage _____ Sq. Ft.
- _____ Sq. Ft.
- 2. Area of building to have ceiling removed or exposed _____ %
- 3. (Divide Line 2 by Line 1) x 100
- 4. If Line 3 equals or exceeds 75%, then the entire structure must be retrofitted with an NFPA 13D automatic fire sprinkler system. Separate permits for the automatic fire sprinkler system and any water meter upgrades will be required.

I attest that the information on the worksheet is accurate and truthful to the best of my knowledge:

Applicant Name (printed) _____

Applicant Signature

Date:

By signing this affidavit, I understand that an NFPA 13D automatic fire sprinkler retrofit will be required when:

- 1. The area of additions to the building since November 6, 1991 exceed the November 6, 1991 building by 100%, or
- 2. 75% or greater of the ceiling is removed or exposed.

Owner's Name Printed _____

Owner's Signature _____

Date _____

Part 2 (Commercial Projects)

A. Occupancy Classification

In all buildings/structures having a total floor area equal to or greater than five thousand square feet when a change in occupancy classification or use occurs that results in a more hazardous use, based on life and fire risk than the existing occupancy classification or use.

- 1. Current building area _____ Sq. Ft.
- 2. Current occupancy classification per California Building Code _____
- 3. Proposed occupancy classification per California Building Code _____

Occupancy types required to have an automatic fire sprinkler system installed by the California Building Code or California Fire Code when the square footage is less than 5,000 square feet will comply with the requirement of the California Building Code and/or California Fire Code.

B. Ceiling Area

- 1. Current building area _____ Sq. Ft.
- 2. Area of building to have ceiling removed or exposed _____ Sq. Ft.
_____ %
- 3. (Divide Line 2 by Line 1) x 100
- 4. If Line 3 equals or exceeds 75%, then the entire structure must be retrofitted with an NFPA 13 automatic fire sprinkler system. Separate permits for the automatic fire sprinkler system and any water service upgrades will be required.

C. Area Increase

- 1. November 6, 1991 legal/recorded building area _____ Sq. Ft.
_____ Sq. Ft.
- 2. Building area added since November 6, 1991 (Including currently proposed additions) _____ Sq. Ft.
_____ %
- 3. Add Line 1 and Line 2
- 4. (Divide Line 3 by Line 1) x 100
- 5. If Line 2 equals or exceeds 2500 sq. ft. and Line 3 is equal to or greater than 5000 sq. ft. and Line 4 equals or exceeds 10%, then the entire structure must be retrofitted with an NFPA 13 automatic fire sprinkler system. Separate permits for the automatic fire sprinkler system and any water service upgrades will be required.

I attest that the information on the worksheet is accurate and truthful to the best of my knowledge:

Applicant Name (printed) _____
Applicant Signature _____
Date: _____

By signing this affidavit, I understand that an NFPA 13 automatic fire sprinkler retrofit will be required when:

- 1. The building area is equal to or exceeds 5000 sq. ft. and the proposed occupancy classification is determined to be a more hazardous use, or
- 2. 75% or greater of the ceiling is removed and/or exposed, or
- 3. The sum of the existing building area and proposed addition is equal to or exceeds 5000 sq. ft. and the addition is equal to or exceeds 2500 sq. ft. or the proposed addition is equal to or exceeds 10% of the current building area.

Owner's Name Printed _____

Owner's Signature _____ Date _____

Hours: Monday, Tuesday, Wednesday, and Friday: 7:30a.m. – 5:00p.m.
Thursdays: 9:00a.m. – 5:00p.m.
Closed Alternate Fridays
Note: No Financial Transactions after 4:30p.m.

Location: Ventura City Hall, 501 Poli Street, Room 117
Mailing Address: P.O. Box 99, Ventura CA 93002-0099
Phone: (805) 677-3941

This document is available in alternate formats by calling the City of Ventura Building & Safety at (805) 677-3941 or contacting the California Relay Service.

Appendix B – Fire Sprinkler Ordinance

CFC APPENDIX L – FIRE PROTECTION SYSTEMS

L101 General. An automatic fire extinguishing system shall be installed in all occupancies and locations as set forth in Appendix L and Chapter 9.

L102 Definitions.

“Building/Structure, Existing” – buildings or structures permitted, constructed and final authorization for occupancy received prior to November 6, 1991 by the authority having jurisdiction.

“Building/Structure, New” – buildings or structures permitted, constructed and final authorization for occupancy received on or after November 6, 1991 by the authority having jurisdiction.

“Floor Area” – as defined by the California Building Code

“Multiple Use Occupancies” – buildings or structures that contain more than one occupancy group listed in Section 202 as determined by the fire code official.

L103 Where required. Approved automatic sprinkler systems shall be provided in new and existing buildings/structures in the locations as described in this section.

L103.1 New Buildings/Structures. In all new buildings or structures, to be occupied by Groups A, B, E, F, H, I, L M, R, S, U, or mixed use occupancy classifications when over 500 sq. Ft. in floor area. For all new townhouses and one- and two- family dwellings an automatic fire sprinkler system shall be installed per the California Residential Code.

EXCEPTIONS:

- (1) Detached U occupancy carports used for motor vehicle storage intended for no other use or storage that are open on sixty percent (60%) of exterior walls. Such carports are limited to three thousand (3,000) square feet or less in floor area and will be constructed entirely of noncombustible materials. Treated lumber is not allowed.
- (2) Detached residential U occupancy carports or garages limited to one thousand (1,000) square feet or less in floor area.
- (3) Non combustible detached car wash structures, provided the car wash is separated from other structures with an assumed property line.
- (4) Public schools shall comply with Section 903.2.2 of this code.

L103.2 Existing Buildings/Structures.

L103.2.1 In all existing residential buildings or structures when cumulative additions are made which result in a total floor area 100% or greater than the November 6, 1991 area of the building or structure.

L103.2.2 In all other existing buildings/structures, when cumulative additions are made which results in a total building/structure floor area equal to or greater than five thousand (5000) square feet and the additions exceed the greater of:

- a) Ten percent (10%) of the original floor area, or
- b) Two thousand five hundred (2500) square feet.

EXCEPTION: Occupancy types required to have an automatic fire sprinkler system installed by the California Building Code when the square footage is less than 5,000 square feet will comply with the requirements of the California Building Code.

L103.2.3 In all existing buildings/structures, having a total floor area equal to or greater than five thousand (5,000) square feet when a change in occupancy classification or use occurs that results in a more hazardous use, based on life and fire risk than the existing occupancy classification or use.

EXCEPTION: Occupancy types required to have an automatic fire sprinkler system installed by the California Building Code when the square footage is less than 5,000 square feet will comply with the requirements of the California Building Code.

L103.2.4 In all existing buildings/structures where renovations occur requiring a building permit and the total area of the ceiling covering removed or exposed exceeds 75% or greater of the total floor area of the building/structure.

EXCEPTION: Occupancy types required to have an automatic fire sprinkler system installed by the California Building Code will comply with the requirements of the California Building Code.

L104 Installation Requirements

L104.1 Modifications

L104.1 For the purposes of this Appendix, fire walls shall not be considered as creating separate buildings.

L104.1.2 Where allowed, sprinkler systems installed in accordance with NFPA 13D in Group R-3 occupancies shall provide sprinkler protection for attached Group U occupancies.

L104.1.2 When NFPA 13R sprinkler systems are provided in Group R occupancies, exceptions to, or reductions in, code requirements are not allowed based on the installation of either a NFPA 13R or NFPA 13 sprinkler system. This shall also include requirements in the California Code of Regulations, Title 24, Part 2 and Part 9.

L104.1.3 Buildings/structures containing multiple use occupancies which include one or more Group R occupancies shall be protected throughout with fire sprinklers that meet NFPA 13 standards.