

COLORADO SPRINGS FIRE DEPARTMENT, DIVISION OF THE FIRE MARSHAL

# AUTOMATIC FIRE SPRINKLER SYSTEMS

General Requirements per Chapter 9 of the Locally Amended 2015  
International Fire Code and the Applicable NFPA Codes.



Fire Construction Services  
8/19/2021



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## **PURPOSE**

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

## **SCOPE**

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This guidance document outlines the minimum requirements set forth in the International Fire Code, local amendments, and departmental policies and procedures as they relate to the installation of automatic fire sprinkler systems. This guidance document is not intended to provide an all-inclusive listing of submittal and inspections requirements, as it would be virtually impossible to cover all situations. This guidance document only covers requirements set forth in the latest edition of NFPA 13 and may be used as guidance for submitting NFPA 13D and 13R systems as well. In addition, this document provides guidance for local requirements for standpipe systems and fire pumps. Also included is information covering items required to be included on the working drawings and supporting documents.

## **DEFINITIONS**

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CSFD	Colorado Springs Fire Department
CSU	Colorado Springs Utilities
Ft <sup>2</sup>	Square feet
FDC	Fire Department Connection
GPM	Gallons per Minute
IFC	International Fire Code
K-factor	Sprinkler head discharge coefficient
NFPA	National Fire Protection Association
NICET	National Institute for Certification in Engineering Technologies
PSI	Pounds force per square inch
RBD	Regional Building Department
SIN	Sprinkler Identification Number
RME	Responsible Managing Employee
CD	Compact Disc

## **GUIDELINES**

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### **I. INTRODUCTION.**

#### **A. APPLICABLE CODES AND STANDARDS.**

1. 2015 International Fire Code and its local Amendments
2. 2019 Edition of NFPA 13 Installation of Sprinkler Systems and associated standards

3. 2019 Edition of NFPA 72 National Fire Alarm Code
4. 2019 Edition of NFPA 14 Standard for the Installation of Standpipe and Hose Systems
5. 2019 Edition of NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection
6. 2019 Edition of NFPA 24 Standard for private Fire Service Mains and Their Appurtenances
7. Colorado Springs City Ordinances
8. CSFD Administrative Rulings/Interpretations

**B. ADMINISTRATIVE REQUIREMENTS.**

1. **Approved Contractors.** All fire sprinkler contractors must obtain a Colorado Springs Fire Suppression Contractor A (FSC-A) License in order to design, install, add to, alter, service, repair, and inspect automatic fire sprinkler and standpipes systems of all types as well as retrofit existing systems with backflow preventers, in accordance with Pikes Peak Regional Building Code, Section 207. Please contact Regional Building Department, Contractor Licensing at 719-327-2887 for additional information on obtaining a license.

**Fire Suppression Backflow Preventers.** Contractors performing testing, maintenance, or repairs of fire suppression backflow preventers must be either licensed as a Fire Suppression Contractor A through RBD or obtain a Fire Suppression System Contractor – Backflow certification through the Colorado Division of Fire Prevention and Control. Only a contractor with a Fire Suppression A contractor license can design, alter or retrofit a fire suppression backflow.

Upon repair, maintenance, testing or inspection the licensed contractor shall provide a tag on the backflow with the: 1. Work performed, 2. Date work was performed, 3. Name of Contractor performing the work, and 4. Certificate number from Fire Suppression System Contractor –Backflow certification or identification number from the Fire Suppression Contractor A license.

2. **Approved Installers.** A Colorado Springs licensed Installer (FSI) shall be on-site for all installations, additions, alterations, repair and inspections of fire sprinkler systems, in accordance with Pikes Peak Regional Building Code, Section 207. Please contact Pikes Peak Regional Building Department, Contractor Licensing at 719-327-2887 for additional information on obtaining a license.
3. **Code/Standard Editions.** Fire Sprinkler systems shall meet the criteria of the adopted codes as amended and all applicable requirements of the most recent edition of the NFPA standards. NFPA standards are effective on January 1st of the year following the effective date printed in the standard.
4. **Permits/Inspections.** Required plan submittal with approvals and permits must be secured through CSFD prior to the start of any work. Permitted work must be inspected by CSFD.
5. **Special Circumstances.** Depending upon the scope of work, different types of submittals may be required; therefore, you may want to contact Fire Construction Services for additional information.
6. **Alternative Methods.** If special building conditions and/or restrictions exist that may prohibit any of the requirements set forth in this guidance document from being met, approval from CSFD for an alternative means and methods approach is required. The alternative means and methods must be approved before installation of the system begins.
7. **Non-Required Systems.** All non-required fire sprinkler systems shall meet the requirements of adopted codes and standards. Additionally, they shall be submitted for

review and approval to CSFD (IFC 901.2).

8. **Revisions.** All revisions shall be clouded and identified with a sequential numbering or lettering system, such as Revision A, B, etc. or Revision 1, 2, etc. Revisions are date sensitive, thus each revised sheet must bear the date of the revision.
9. **As-Built Plans.** All deviations from approved plans shall be documented and submitted to CSFD for archiving. Reviews will not be conducted on as-built plans, unless specifically required by the fire inspector, as these field changes are often verified as compliant by the fire inspector. All as-built plans shall be conspicuously marked as such.

## II. SUBMITTAL INFORMATION.

This section of the guidance document provides information regarding documentation and shop drawings that shall be provided at the time of plan submittal. This documentation is required to assure the plan submittal package contains the necessary information for a complete plan review.

### A. CONSTRUCTION DOCUMENTS.

Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in it conforms to the provisions of the IFC, NFPA standards, relevant laws, ordinances, rules and regulations as adopted by the City of Colorado Springs.

Plans shall be legible, dark-lined and reproducible with conventional copying equipment. Please do not use colored highlighting as these are frequently not reproducible. Also, do not use colored or gray background shading as it interferes with archiving.

When a project is associated with a building permit, sprinkler plans shall reflect the scope of work as approved under the building permit. The scopes of work must match. This is especially crucial when you have multiple permits within the same building.

When working on an existing system, you must provide details on that system such as original installation date, original requirements of the system or its intent, requirements based on occupancy and occupant load, etc.

### B. MINIMUM REQUIREMENTS OF 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 the CSFD Construction Services if you have questions regarding the use of different scales. Plans shall contain the information and/or details indicated in the checklist in the appendix.
2. **Plan Review Number.** Submittals associated with a construction project shall be provided with the CSFD Plan Review Number. This number is an eight-digit numeric code located on the back of the construction plans. Suppression system work only projects shall be indicated as such on the submittal so that it can be assigned a plan review number.
3. **Number of Drawing Sets.** A minimum of two (2) sets of drawings are required to be submitted to CSFD. A maximum of three (3) original sets will be stamped with CSFD approval. All plan sheets shall be signed/sealed by an RME of the licensed submitting contractor.
4. **Cut Sheets/Specifications.** A minimum of one (1) set of manufacturer's product information shall be provided. This is to include information on all devices that are part of or being connected to, the fire sprinkler system; such as piping, valves, hangers, method of supporting/mounting equipment, pipe, and conduit, etc. When cut sheets show multiple models/types of devices, the specific item(s) being installed shall be highlighted. For example, in using extended coverage heads, the spacing utilized in the design and calculations shall be highlighted on the cut sheets as well as indicated on

the drawings.

A table of contents shall be provided and the specifications package shall be tabbed with the following sections: Water supply, Sprinklers, Piping and Fittings, Valves, Hangers, Appurtenances and other system components, Fire Department Operating instructions for the entire system (including copy of instructions to be posted next to the Sprinkler Riser), and Manufacturer approved testing instructions. Stamped cut sheets will be returned to the contractor and must remain on the job site with the approved plans. The cover of the cut sheets shall be signed/sealed by an RME of the licensed submitting contractor. Stamped cut sheets will be returned to the contractor and must remain with the approved plans, on the job site.

CSFD accepts cut sheets on CD. The CD must have the individual cut sheets for the materials specific to the job – we will not accept manufacturer's CD's! If this option is chosen, the CSFD will stamp, date and initial the CD – it is then the contractor's responsibility to provide the means of reviewing that disk upon the fire inspector's request.

5. **Hydraulic Calculations.** A minimum of two (2) sets of hydraulic calculations shall be submitted to CSFD and shall contain the information and/or details indicated in the checklist in the appendix. Calculations shall be rolled inside the plans to prevent them from becoming separated, if the hydraulics set is too large to feasibly roll them, a binder identifying the project, is acceptable. One set will be retained by CSFD for our records. The cover page of all hydraulic calculations shall be signed/sealed by an RME of the licensed submitting contractor.
6. **Code Study.** In some cases, CSFD will require a code study of the design criteria for the system being submitted. Most commonly, this is required in storage occupancies utilizing high pile storage and/or in-rack sprinkler systems. Each step is required to be detailed, reference each code or standard section used in arriving at the design criteria for the sprinkler system. Be sure to show your work when increasing or decreasing densities or design areas.
7. **Water Supplies and Backflows.** Theoretical water supply information shall be obtained from CSU, or theoretical/actual flow report from the local water district for delegated reviews shall be provided. A copy of the CSU backflow preventer submittal form shall also be included with your plan submittal for new backflow installations within the City of Colorado Springs.
8. **Freeze Protection.** If freeze protection is being utilized to protect sprinkler piping, then the sprinkler submittal must specify the type of freeze protection being provided. Specifications for the freeze protection shall be provided as part of the submittal. Specifications must be provided even if the freeze protection is being installed by another contractor.

### III. GENERAL INFORMATION AND REQUIREMENTS.

#### A. FIRE DEPARTMENT CONNECTIONS.

Fire department connections shall be readily visible and accessible. FDC's shall not be obstructed by any landscaping, parking or storage, fences, etc. at anytime.

All FDC's shall be installed at locations approved by the CSFD on the front entrance and/or addressed side of the structure. There are some instances where this location is not possible, please contact Fire Construction Services in these situations.

The FDC shall be located within 40 feet of an approved fire department access road. Additionally, a fire hydrant capable of meeting the required sprinkler supply demand shall be provided within 100 feet of the FDC.

All standpipe and automatic fire sprinkler system FDC's shall be properly identified so as to

indicate clearly what each component or each piece of equipment serves. One inlet for every 250 GPM in system demand shall be provided. The FDC piping shall be the same size as the sprinkler riser for individual systems, or the largest zone piping where multiple zones are supplied by a single FDC.

When the sprinkler system exceeds a demand of 1500 GPM, a secondary FDC of the same capacity in an approved secondary location will be required. Each FDC is required to be located within 100 feet of a hydrant and 40 feet of an approved fire department access road.

An exterior weatherproof electric horn/strobe unit shall be installed proximate to and within 20 feet of the FDC. The horn/strobe shall be at a height and location that is visible to responding emergency crews.

Adequate signage shall be provided identifying the exact device type and exact area(s) served, and shall comply with CSFD requirements (area of building served, pressure/flow requirements for manual standpipes, etc.) Contact Fire Construction Services if you have questions.

## **B. MONITORING.**

New automatic sprinkler systems shall be electronically supervised by an approved monitoring agency when there are 6 or more sprinklers in all occupancies.

Existing automatic sprinkler systems (installed pre-November 2005) may be supervised in accordance with the fire code adopted at the time of original installation. NFPA 13:16.9.3.3.1 provides some guidance on acceptable methods of supervision as indicated below in order of descending preference.

1. Electronically supervised by an approved monitoring company
2. Local signaling service that will cause an audible signal at a constantly attended point
3. Locked in the open position
4. Located within a locked or fenced enclosure under the control of the owner, sealed in the open position, and inspected weekly as part of an approved procedure.

## **C. WATER SUPPLY INFORMATION.**

CSFD will accept actual flow tests for fire sprinkler plan submittal and hydraulic calculations on a case-by-case basis. Delegated reviews for outside fire protection districts shall contact the local water district to obtain water supply information. The information on this report shall be dated within one (1) year. A copy of the water supply information shall be provided with your submittal package.

The water supply graph shall indicate a second curve showing 10% reduction in the water supply. This curve shall be separate and distinguishable and have a slope parallel to the 100% supply curve. You must provide the 100% theoretical water supply information, with the reduced water supply information indicated on the graph sheet, or on the plans. Do not supply us with only the reduced information.

Example of correct 10% water supply reduction:

100% water supply: static: 145 psi; residual: 20 psi; Flow: 3400 GPM

90% water supply: static:  $145 \times .9 = 130.5$  psi; residual:  $20 - (145 - 130.5) = 5.5$  psi; Flow: 3400 GPM

The required sprinkler system flow and pressure, including applicable hose demand, shall fall on or under the 90% water supply curve.

Fire Pumps shall be sized to supply the equipment that they serve. Where pumps serve sprinklers only, they can be sized to provide the flow for the sprinkler system, ignoring any hose stream demands. Demands of equipment not connected to the fire pump (such as

outside hose demand) can be ignored except for evaluating their impact on the available water supply to the pump.

**D. HIGH PILED STORAGE AND HIGH CHALLENGE COMMODITIES.**

In buildings used for high-pile combustible storage, fire protection shall meet the criteria of the IFC and the applicable NFPA standards. Please be sure to provide a copy of the completed high piled combustible storage questionnaire along with the submitted plans.

To expedite reviews, provide a code study on how the design criterion was determined for the sprinkler system. Information on how the design density and area were determined must be provided – this is especially critical when there are multiple adjustments for various storage arrangements. Each code section must be referenced and all math work must be shown.

The design professional shall perform a survey of the stored commodities to ensure the design is based on the most challenging commodity stored or to be stored in the building and if used, the method of separating or isolating these commodities. The sprinkler shop drawings or technical report shall explain the criteria for determining the basis for commodity selection, how the commodities will be isolated or separated, and any design documents used such as Factory Mutual Data Sheets or fire test reports.

Please reference the Plan Submittal Requirements Checklist in the appendix for additional plan requirements for these systems.

1 ½" hose valves for mop up operations are not required by the adopted IFC for high pile storage occupancies.

**E. LIMITED AREA SYSTEMS.**

Limited area systems involve 6 or fewer sprinklers. These are permitted to be supplied from the domestic water system. Typically, these systems are used in medical gas rooms or other isolated hazard areas in an otherwise non-sprinkled building. References from NFPA 101, 99 and 13D are used in the review of these systems.

For protection of medical gas installations, remember the rooms are required to be ventilated, often to the exterior. Additionally, radiant heat sources are not recommended for heating of these rooms due to the fire hazard they create with the medical gases. This makes installation of wet pipe sprinklers a challenge in the least. CSFD recommends the use of dry sprinklers for these areas.

**F. Exempt Locations**

Reference IFC 903.3.1.1.1 for a list of locations where automatic fire sprinklers is permitted to be omitted.

**G. HEALTHCARE AND STATE PROJECTS.**

When dealing with healthcare or State facilities, check with the appropriate State of Colorado agency for additional requirements that may over-ride our local amendments. Application of NFPA 101 is permitted and in some instances required. These additional requirements must be coordinated with CSFD.

**H. TENANT FINISH/REMODELS.**

Submittals shall include the entire project area including adjacent spaces and devices as necessary to show proper sprinkler coverage. New, relocated and existing equipment shall be designated with "N", "R", and "E" subscripts.

Deficiencies caused by tenant finish or remodel work shall be corrected prior to final inspection. This means if the scope of work causes a deficiency in the system, that deficiency becomes your responsibility to correct. For example, a demising wall is erected for a new tenant and that demising wall creates a spacing issue of sprinklers outside the new tenant space, you must correct that spacing issue prior to final inspection. CSFD will consider this as part of your scope of work.



Additionally, you must provide the design criteria (density and operating area), the code edition the system was originally designed and installed to as well as the system demand and a current static pressure reading from the riser.

Sprinklers removed for any reason shall NOT be reinstalled per NFPA 13: 16.2.1.1, unless the requirements of A16.2.1.1 are met.

Sprinklers and diffusers have been a point of discussion for several years. If existing ordinary temperature rated sprinklers are located within 2'-6" of horizontal discharge diffusers are not being relocated as part of a remodel AND their location/temperature rating was accepted by CSFD upon their installation, they may remain. All new sprinkler heads installed as part of the scope of work for this remodel are required to meet the requirements of NFPA 13: Table 9.4.2.5.

1. **20-Head Letters.** If the work consists of 20 heads or fewer, the work may be submitted to CSFD as a 20-head letter. See the Administrative Permit section of this document for the submittal requirements for a 20-head letter.
2. **Turning Heads Upright to Accommodate a Demolished Ceiling.** This work may be accepted on a letter. These are considered on a case-by-case basis, please contact Construction Services for guidance.
3. **Plugging of Heads.** This work may be accepted on a letter. These are considered on a case-by-case basis, please contact Construction Services for guidance.

#### I. VESTIBULES.

Vestibules have proven to be a frustrating feature during the freezing temperatures we experience in Colorado. Vestibules that are outside the building envelope, unheated, and with no storage of saleable or combustible goods are good candidates for the omission of fire sprinklers. Each vestibule will be reviewed on a case-by-case basis for the omission of fire sprinklers to prevent potential property damage due to frozen pipes.

#### J. EMERGENCY REPAIR WORK

Emergency repair work is defined as that minimum work necessary to return a damaged or impaired system to satisfactory and fully functional status.

Emergency repair work may proceed without a permit provided the system is repaired to its original configuration, and a permit application (with submittals) is submitted by the next business day after the work is completed.

- K. Decommissioning Systems.** When systems are to be removed from service, a letter shall be submitted to Fire Construction Services detailing the reason(s) for the system being removed. Information on the building, occupancy classification and occupant load shall be included (IFC 105.7.21). This documentation shall show why the sprinkler system is no longer required and can be removed.

#### L. ADDITIONAL REQUIREMENTS.

1. **Floor Control Valve Assemblies.** Buildings exceeding 2 stories shall be provided with the following for isolation, control and annunciation of water flow for each floor level:
  - a. Floor control valve
  - b. Check valve
  - c. Main drain valve
  - d. Flow switch.

Exceptions: Where the top level of sprinklers is supplied by the level below and the aggregate floor area does not exceed the system protection area limitations per NFPA 13: 16.9.11.

2. **Buildings under construction** shall have fire protection equipment installed and maintained in accordance with the IFC.

Prior approval from CSFD shall be obtained before combustible materials are stored or moved into buildings until such time fire protection systems are operational and on-line. Factory Mutual Data Sheet 1-0 *Safeguards During Construction* and NFPA Standard 241 *Safeguarding Construction and Alteration Operations* both speak to this issue as a safe operating practice. Having fire sprinkler and alarm systems operational prior to storage of, or moving in of, combustible materials (including but not limited to building furnishings) reduces the amount of fire, smoke and water damage should a fire occur.

Buildings requiring standpipes shall have a temporary standpipe and an FDC installed when the constructed height of the building reaches 40 feet above the lowest level of fire department access per IFC 3313.

3. **Approved signage** must be provided on the door of the enclosure in which any sprinkler system valves/controls are located stating "Fire Control Valves" in 2-inch-high block letters with a stroke of not less than ¼ inch and a color contrasting with its background (NFPA 13: 16.9.12 and IFC).

Valves or switches which are located within building elements must also be identified in an approved, suitable and easily identifiable method or manner at the point/location giving access to said valve or component.

Signs shall be permanent, weatherproof and appropriately secured in accordance with NFPA 13: 16.9.12.

A general information sign used to determine system design basis and information relative to the requirements of NFPA 25 shall be provided with a permanently marked weather-proof metal or rigid plastic sign, secured at each system control riser, antifreeze loop and auxiliary control valve, per NFPA 13: 28.6.2. This sign shall include the following:

1. Name and location of the facility
2. Occupancy classification
3. Commodity Classification
4. Presence of high-pile and/or rack storage
5. Max height of storage planned
6. Aisle width planned
7. Encapsulation of pallet loads
8. Presence of solid shelving
9. Flow test data
10. Presence of flammable/combustible liquids
11. Presence of hazardous materials
12. Presence of other special storage
13. Location of venting valve
14. Location of auxiliary drains and low point drains for dry pipe and pre-action systems
15. Original main drain flow test results
16. Original results of dry pipe and double interlock pre-action valve test
17. Name of installing contractor/designer
18. Indicate of presence and location of antifreeze/other auxiliary systems
19. Where injection systems are installed to treat MIC or corrosion, the type of chemical, concentration of chemical, and where information can be found as to the proper disposal of the chemical.

High Pile/High Challenge systems shall have their capabilities and limitations identified. A permanent sign shall be provided at or adjacent to each sprinkler riser. This sign shall include the following information:

1. Design base or basis, including the edition used

2. A statement indicating if the sprinkler design is control mode density area method, control mode specific application, suppression mode or any combination thereof
3. When used, all of the storage conditions stipulated for special designs
4. The maximum storage height
5. The minimum required aisle width
6. If storage is in racks, the maximum rack width and minimum transverse and longitudinal flue widths
7. Commodities that can be protected by the automatic sprinkler system
8. Commodities that cannot be protected by the automatic sprinkler system
9. Limits on storage heights of idle wood and plastic storage
10. Limits on storage heights of miscellaneous Group A plastics, tire and rolled paper storage
11. Locations where in-rack sprinklers are used
12. Locations where horizontal and/or vertical barriers are used
13. Information explaining the manufacturer, SIN, K-factor and operating temperature of the overhead sprinklers protecting the high pile/high challenge storage.

An example sign is provided in the appendix of this document.

4. **Spare Sprinklers Cabinet.** A minimum of 6 spare sprinklers shall be provided and shall include all types and ratings installed per NFPA 13: 16.2.7. One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed. A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet per NFPA 13: 16.2.7.7.1. This list shall include the following:
  - a. Sprinkler Identification Number (SIN) if equipped; or the manufacturer, model, K-factor, deflector type, thermal sensitivity, and pressure rating
  - b. General description
  - c. Quantity of each type to be contained in the cabinet
  - d. Issue or revision date of the list.
5. **Shell buildings** that are required to be sprinkled shall be required to be designed and installed according to the requirements set forth for "Ordinary Hazard Group II" occupancies. Upon tenant finish, these buildings may be converted to lower hazard classification, if applicable, to the occupancy or use. Because there is no way of telling who a prospective tenant will be, or what kind of hazards that tenant will be bringing into the building, this requirement is intended to mitigate against those hazards which this department may be unaware of. In addition, this ensures the density is provided for most occupancies without system upgrades. (IFC 903.3.1.1.3)
6. **Non-System Components.** Sprinkler piping or hangers shall not be used to support any non-system components! This includes any fire alarm wiring. (NFPA 13: 4.9 and 17.1.3)
7. **Flex Connections.** Systems utilizing flexible sprinkler connections shall be approved for such use. Hydraulic calculations or documentation shall be provided proving their use will not adversely affect the system design. This is applicable for both newly installed systems and existing systems being modified.

In lieu of submitted hydraulic calculations, you may use the Flexible Sprinkler Retrofit Analyzer tool available on our website. This excel spreadsheet allows you to enter key information to determine if there is a negative hydraulic impact on the system. The link to the analyzer can be found in the References and Links section of this document.

**NEW!** You shall calculate the maximum allowed bends for the length of the flex connection chosen. Failure to do so may result in a disapproval of your submittal.

8. **Plastic Pipe and Spray Foam Insulation.** Compatibility shall be verified and proof of application in accordance with manufacturer requirements shall be provided. In

general, it is best to avoid using spray foam insulation with plastic piping due to the exothermic reaction of the spray foam during the curing process. The heat generated by the exothermic reaction can result in the strength of the pipe walls being compromised.

9. **Reduced Pressure Backflows.** Any sprinkler system utilizing a chemical suppressant (i.e., foam), a pump, or a stored water supply in conjunction with the CSU water supply must be equipped with a reduce pressure backflow assembly. The reduce pressure backflow assembly must be listed by USC (University of Southern California - <https://fccchr.usc.edu/list.html> ), and installed in its listed orientation. The reduce pressure backflow must be installed in accordance with Colorado Springs Utilities, and Colorado State Plumbing regulations.
10. **Retroactive Backflow Installation.** The retroactive installation of a backflow assembly is to be in accordance with NFPA 13: 29.1.3 and 29.65. Retrofit of backflows on pipe schedule systems is to be in accordance with NFPA 13: 19.3.2.6.2. Submittals for these retrofits must include the following:
  - a. Minimum of 8 ½" x 11" riser detail
  - b. Current CSU Fire Flow Report with map
  - c. Hydraulic analysis of system if required pressure and flow is known. This analysis should show that the system demand with the added friction loss for the backflow and new fittings is still below the water supply curve. Documentation on how the existing required pressure and flow was determined will need to be provided.
  - d. Provide edition of NFPA 13 that the system was originally approved under

This submittal process would also apply for the replacement of an existing dry, pre-action, deluge, or alarm valve where the valve replacement is not like for like.

A CSFD inspection is required for these retrofits, and a plan review fee will be accessed.

11. **High Volume Low Speed (HVLS) Fans.** All HVLS fans shall be interlocked to shut down immediately upon receipt of a water flow signal at the fire alarm control panel (NFPA 13, 19.2.7).
12. **Pipe Replacement.** Like for like pipe replacements require submittals showing the scope of the pipe replacement, existing hydraulic calculations for the system, the edition of the NFPA 13 that the system was originally approved under, and a current CSU fire flow report (to ensure that the water supply has not deteriorated since the system was installed). If the pipe replacement involves changing the type of pipe (i.e., black to galvanized) or is going from a larger internal pipe diameter to a smaller pipe diameter, then full submittal drawings and new hydraulic calculations will be required.

A CSFD inspection is required for these retrofits, and a plan review fee will be assessed.

The plan review fee for a pipe replacement will be based on the number of sprinkler heads involved in the scope of work along with the number of stories and systems involved.

13. **Standpipes** Buildings requiring standpipes shall comply with IFC 905.
  - a. Standpipes shall be installed on the intermediate stair landings per IFC 905.4.
  - b. Standpipes can be manual or automatic; wet or dry, for non-high-rise buildings (IFC 905.3.1 and NFPA 14: 5.4.1.1)
  - c. Standpipes shall be flow tested per NFPA 14: 11.5. Where manual standpipes are installed, arrangements shall be made with CSFD to procure the staff and fire engine to perform this flow test per NFPA 14: 11.5.2. Call CSFD at 719-385-5950 to make the necessary arrangements and payment for use of CSFD staff and equipment to test these manual standpipes. The contractor is still responsible to provide all required testing equipment (hoses, hose monsters, pitot gauges, etc.)
14. **Elevator Shafts and Elevator Machine Rooms.** See Appendix for guidance on

sprinkler requirements for elevator shafts and machine rooms based on the type of elevator installed.

#### IV. INSTALLATION.

##### A. ADMINISTRATIVE PERMITS.

1. **Work at Risk.** If you need to start work prior to issuance of a permit, approval shall be obtained from CSFD Fire Construction Services to begin work. A letter is to be submitted to CSFD requesting the work at risk and defining the justification for the request. The approved work at risk letter shall be posted on the job site until such time the installation permit is issued (IFC 105.3.4.1). The work at risk should be the last option you turn to, to avoid abuse of the system.
  - a. Request for Work at Risk (WAR) shall be submitted to CSFD Fire Construction Services on the fire sprinkler contractor's letter head.
  - b. The letter must include the name and address of the project, CSFD plan review number, proposed date that work will begin, the proposed work that will be performed prior to issuance of a permit, justification for the work at risk request, and the signature of the company's Responsible Managing Employee (RME).
  - c. Other considerations that will be taken in to account will be: the backlog of plans waiting for review and the number of expedited review requests currently in the office. Contractor performance history in both quality of plans and installations will be considered in granting a work at risk.
  - d. The holder of the work at risk shall be authorized to proceed at their own risk with the installation or modification of the fire sprinkler system, but shall not entitle them to any required inspections of the system or work until drawings are approved and the required construction permit is posted on site.
  - e. Any work performed on fire sprinkler systems will be done at the risk of the installing contractor. Any required changes or modifications based upon approved plan review or inspection activities will be the responsibility of the contractor.
  - f. The granting of a work at risk does not eliminate the contractor's responsibility to maintain up to date red line drawings on site. Any red line modifications made prior to the contractor receiving approved plans and permit must be transcribed onto the approval plans in a timely fashion (prior to initial inspection).
  - g. All work performed under the work at risk must remain visible until CSFD inspection of the work after obtaining approved plans and permit.
  - h. An individual work at risk, a company's ability to participate in the work at risk program, or the entire work at risk program can be suspended at any time at the discretion of the Fire Code Official.
  - i. Work at risk will not be issued for high pile, high hazard, or high challenge designed sprinkler systems.
2. **Demolition Permit.** Approval shall be obtained from CSFD to permanently remove a fire protection system from a building. The approval shall be posted on the job site until such time the final inspection is completed (See decommissioning systems section for required documentation to be submitted).
3. **20-Head Letters.** If the work consists of 20 heads or fewer, the work may be submitted to CSFD as a 20-head letter. All 20-head letters shall be submitted using the letter format template provided in the appendix of this document and shall follow these guidelines:
  - a. Letter shall be submitted to CSFD Fire Construction Services on the fire sprinkler contractor's letter head and be signed/sealed by an RME of the licensed submitting contractor.

- b. A contact name and phone number from the applicant shall be provided, should the CSFD have any questions.
- c. Statement that the water supply is of sufficient capacity and no hydraulic overloading exists.
- d. The system will be installed in accordance with all applicable local codes, standards and regulations as appropriate (e.g., International Fire/Building/Plumbing Codes and NFPA 13, 13R, 13D).
- e. The scope of work is to include exact number and type of sprinkler heads being removed, relocated and/or installed.
- f. A time schedule for start and completion dates.
- g. A sketch of the work area showing the modifications.
- h. The CSFD Plan ID Number and/or RBD Building Permit Number assigned to the project's construction plan. If the work is not associated with a construction permit (deficiency corrections etc.), then the "System Work Only" box is to be marked on the letter.
  - 20 head letters do NOT apply to paint booths or special application systems. They do NOT apply to any scope of work involving a change of use or occupancy, or any other stipulations previously mandated and/or required by CSFD.
  - 20 head letters shall be submitted a minimum of two business days before the start of the work.
  - There is a limit of ONE letter per building permit scope of work.
  - No fire inspections will be performed on this work unless a special request is made or CSFD elects to make quality control checks on the work being performed. Any additions or remodeling to existing commercial and residential fire sprinkler systems that involve 20 sprinklers or fewer will not require the submittal of plans or calculations through CSFD.
  - The approved letter is your permit and shall be posted on the job site.
  - Modifications involving flexible sprinkler connections will NOT be permitted unless one of the following is provided:
    - The sprinkler system was originally designed and approved for their use.
    - Hydraulic calculations are supplied proving the addition of flex connections will not hydraulically overload the fire sprinkler system.
    - Use of the Flexible Sprinkler Retrofit Analyzer is permitted in lieu of hydraulic calculations.
  - Revisions to the scope of work conducted under a 20 head letter require a revised letter to be submitted. If the revisions cause the scope of work to exceed 20-heads, you must submit plans and obtain a full sprinkler permit.
  - At the time the work is completed, a completed installer certification and above ground certificate shall be filed with CSFD within 2 business days.
  - 20-head letters will be accepted for modifications to 13R and 13D fire sprinkler systems as long as the modifications do not impact the hydraulic calculations of these systems.
  - CSFD reserves the right to modify or delete any portion of this program as necessary for the safe monitoring and regulation of fire sprinkler system installations.

## B. CONSTRUCTION PERMITS

1. A construction permit is required for installation of or modification to a fire sprinkler system. Any modification requires a permit (also see 20 head letter section).
2. The installation of the fire sprinkler system is not to commence, including any pre-piping until the working plans have been reviewed and approved by CSFD and a permit secured on site, per IFC 105.1.2.
3. Permits for fire sprinkler systems expire one year after date of issue. A 30-day grace period is allowed to renew the permit. After the grace period expires, if inspections have been conducted in the past 13 months, new plans and permit is not required to be submitted for issuance of a new permit. If the grace period has expired and no inspections have occurred in the past 13 months, new plans shall be submitted prior to issuance of a new permit.
4. Permits will be issued to match the scope of work of the building permit they are associated with. For example: if there are 3 separate building permits issued for interior remodels in different areas of the same building, the fire sprinkler submittals will receive 3 separate permits, regardless if they were submitted on one plan set or separate plan sets. This prevents failures of one scope of work holding up the final of another scope of work.
5. Maintenance is defined as the work necessary to keep equipment operable or to make repairs. An example of maintenance work would be exercising valves, lubing stems or cleaning strainers. Replacing existing sprinklers due to age, paint, or damage would be considered repair work and not subject to permit requirements.

## V. INSPECTIONS AND TESTING.

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

Be advised that approval as the result of an inspection shall not be construed to be an approval of a violation of the provision of the adopted fire code, standards or of other ordinances of the City of Colorado Springs. Inspections presuming to give authority to violate or cancel provision of this code or of other ordinances of the jurisdiction shall not be valid (IFC 106.4).

Systems shall undergo an acceptance test witnessed by CSFD. The building shall not be occupied or stocked with furniture until the sprinkler system has been inspected and approved by CSFD.

### A. ABOVEGROUND PIPING.

1. **Visual Inspection.** Sprinkler piping and hangers shall not be covered and/or concealed by any means prior to a visual inspection being conducted and accepted by CSFD. THIS INCLUDES DROP GRID STYLE CEILINGS! Ceilings, including finished sheet rock, will be required to be removed, if necessary, for inspection.
2. **Hydrostatic Test.** All piping and joints in standpipe and/or sprinkler systems, including the FDC piping, require the minimum 200-psi hydrostatic test per NFPA 13: 6.10.2 and 28.2.1. All pipe joints shall be exposed to expedite the verification of leak-free joints. The test shall be witnessed and accepted CSFD.

Where system working pressure exceeds 150 psi, the hydrostatic test shall be performed at 50 psi in excess of the system working pressure per NFPA 13: 28.2.1.3.

Additions/Modifications to existing systems involving more than 20 sprinklers, the area shall be isolated and tested at not less than 200 psi for a minimum of 2 hours. If the area cannot be isolated, it shall be tested at the system's normal static pressure.

**3. System Operational Tests.**

**Main Drain.** Sprinkler and/or standpipe systems shall undergo a main drain test to establish a base line residual pressure for future reference in accordance with NFPA 13: 28.2.3.4.

**Trip Test.** Dry Pipe/Pre-action/Deluge valves shall undergo a working trip test or automatic operation in accordance with NFPA 13: 28.2.3.2 and 28.2.3.3.

**PRV's/BFP's** shall undergo testing to ensure proper operation per NFPA 13: 28.2.4 and 28.2.5.

**B. UNDERGROUND PIPING.**

1. **Visual Inspection.** CSFD does not perform a visual inspection of the underground fire lines; CSU Water Inspections will inspect the fire line and approve the burial.

Remote FDC pipe that is not tied directly into the water supply is not inspected by CSU. This piping must be visually inspected by CSFD prior to burial.

2. **Hydrostatic Test.** The underground fire line requires a 200-psi hydrostatic test per NFPA 13: 6.10.2. The test shall be witnessed and accepted by CSFD. Underground piping is allowed minimum leakage in accordance with NFPA 13.

3. **Underground Flush.** Underground piping from the water supply to the system riser and lead-in connection to system riser shall be completely flushed before any connection is made to fire protection system piping (NFPA 13:10.10.2). In addition, any underground system piping (remote free standing FDC, pipe ran underground below breezeways, etc.) shall also be flushed before piping is connected to the system. This test shall be witnessed and accepted by CSFD.

Flushing shall continue for sufficient time to ensure thorough cleaning, usually until the water runs clear, or about 5-minutes. Be advised the CSU chlorination flush does NOT replace the CSFD required flush.

Minimum flow rate shall be not less than one of the following:

- a. Hydraulically calculated demand rate of the system, including any hose requirements.
- b. Flow necessary to achieve a velocity of 10 ft/sec in accordance with NFPA 13 Table 6.10.2.1.3. Minimum Flow Rates (Preferred method)
- c. Maximum flow rate available to the system under fire conditions.
- d. Flow rates shall comply with NFPA 20 if a fire pump is utilized (20 ft/sec).

<i>Underground Pipe Size (in)</i>	<i>Required Flow Rate (gpm)</i>	<i>Hose/Pipe Sizes</i>					
		2 ½"	3"	4"	5"	6"	8"
4	390	1	1	1	-	-	-
6	880	2	2	1	1	1	-
8	1560	4	3	2	1	1	1
10	2440	6	4	3	2	1	1
12	3520	8	6	4	2	2	1

**C. COMPLETION DOCUMENTS.**



1. The completed *Contractor's Material and Test Certificate for Aboveground Piping* form shall be provided to the fire inspector at the time of final inspection. Be sure to use the updated form in the 2019 edition of NFPA 13. Previous editions will NOT be accepted.
2. The completed *Contractor's Material and Test Certificate for Underground Piping* form shall be provided to the fire inspector at the time of the underground and hydrostatic inspection. Be sure to use the updated form in the 2019 edition of NFPA 13. Previous editions will NOT be accepted.
3. An owner's manual and installation instructions covering the fire sprinkler systems equipment.
4. A copy of the completed Fire Sprinkler System Installer's Certification shall be provided to the fire inspector at the time of final inspection.
5. Permanent records such as hydraulic nameplate and general information in accordance with NFPA 13, as well as copy of NFPA 25 *Inspection Testing and Maintenance of Water-Based Fire Protection Systems* shall be provided to the building owner.

## REFERENCES AND LINKS

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Colorado Division of Fire Prevention and Control website: <http://dfpc.state.co.us/>

CSU Water & Wastewater specifications: <http://www.csu.org/>

Flexible Sprinkler Retrofit Analyzer: [https://coloradosprings.gov/sites/default/files/inline-images/flexiblesprinklerretrofitanalyzer\\_1\\_9\\_19.pdf](https://coloradosprings.gov/sites/default/files/inline-images/flexiblesprinklerretrofitanalyzer_1_9_19.pdf)

Administrative Rulings and IFC Amendments can be found on the CSFD web site at: <https://coloradosprings.gov/fire-department/page/fire-code-amendments-and-administrative-rulings?mlid=9796>

Installer's Certification can be found on the CSFD web site at: <https://coloradosprings.gov/fire-department/page/fire-protection-systems?mlid=31141>

## APPENDIXES

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- A. Working Drawing Submittal Checklist
- B. Hydraulic Calculations Checklist
- C. Sample Signage for High-Pile/High Challenge Fires
- D. Fire Sprinkler/Fire Alarm Flow Chart for Elevator Shafts and Equipment Rooms
- E. 20-Head Letter Template

## Appendix A

### Plan Requirements per NFPA 13 and CSFD. Working Drawings

#### Title Block shall contain the following:

- Name of owner and occupant
- Location including full street address as assigned by RBD Enumerations
- Name, address, phone, FAX number and email address of installing contractor and designer
- Signature/seal that these drawings were reviewed by a person registered as a RME for company.
- CSFD Plan Review number
- Point of Compass on every page
- A scale including graphic representation
- Detailed scope of work

#### Information required on Drawings:

##### Building Information:

- Construction type and occupant load
- Full height scaled elevations and cross sections of the building. Be sure to include structural information and ceiling construction for clarity. Section cut lines shall be indicated
- Location of partitions, fire walls and /or area separation walls and rating classifications
- Location of full-height walls
- Occupancy class of each room/area as well as the Hazard/Commodity Classification
- Location of concealed spaces, closets, attics and bathroom including dimensions
- Location areas where sprinklers have been intentionally omitted. Must also note with a code reference why sprinklers were omitted from these areas
- Building key plan for interior remodels

##### Site Plan Information:

- Size of city main(s), circulating or dead end and if dead end, the distance to the nearest circulating main.
- City main theoretical flow test results from CSU
- Underground pipe size, length, location, material and point of connection to city main with hydraulic nodes

##### System Information:

- Sprinkler Legend to include: Make, type, temperature rating, K-factor, SIN and nominal orifice size of sprinklers. Sprinkler head spacing dimensions and the listed spacing used for special sprinklers
- Piping Legend to include: Pipe type and schedule of wall thickness, actual internal diameter
- Temperature rating and location of high temperature heads
- Area protected by each system on each floor and total area being protected

- ❑ Number of sprinklers on each riser per floor and total number of sprinklers per building. Also, total number of sprinklers on each Dry, Pre-action, Antifreeze or Deluge System
- ❑ Approximate capacity in gallons of each dry pipe and/or pre-action system
- ❑ Information about antifreeze solution used (type and amount)
- ❑ Complete riser detail
- ❑ Location, size and piping arrangement of FDC including kind and location of alarm bells (exterior horn/strobe)
- ❑ FDC is provided with an automatic drain
- ❑ Information about backflow preventers (manufacturer, size, type)
- ❑ Location and type (wet/dry, automatic/manual) of standpipe risers, outlets/valves and related equipment
- ❑ Location and details of all control valves, check valves, drain pipes and test connections
- ❑ Make, type, model and size of all alarm, dry, pre-action or deluge valves
- ❑ Size, type and setting for Pressure-reducing valves
- ❑ Fire Pump type (including manufacturer and model), capacity, speed, rated net pressure, diameter of impeller, inlet and outlet diameters, fuel or electrical requirements and location
- ❑ Fire Pump Test Header is provided with an automatic drain
- ❑ Nominal pipe size and cutting lengths of pipe (center-to-center dimensions)
- ❑ Type of fittings, location and size of riser nipples, size of welds and bends. Including any flex connections
- ❑ Type and location of hangers, inserts and sleeves
- ❑ Location of inspector's test connection and location of discharge. If discharge is to a storm drain, size of drain
- ❑ Wet system drains extend at least 4-feet into heated space, before entering an unheated space
- ❑ Dry system low point drains are provided and the inspector test connection provides an arrangement minimizing condensation collection
- ❑ Piping provisions for flushing
- ❑ When a new system is an addition to an existing system, enough of the old system shall be indicated and included on the plans to show the total number of sprinklers to be supplied and to make all conditions clear
- ❑ Hydraulic reference corresponding with comparable reference points on the hydraulic calculation sheets
- ❑ System design criteria showing **minimum** density, the design area and the required water flow for hose streams, both inside and outside. Also indicate the **total** water and pressure required
- ❑ For hydraulically designed systems, the information on the hydraulic data nameplate attached to the riser. Show flow and pressure required at the system gauge and at the city side gauge below the backflow
- ❑ Any adjustments to the design area(s) or density(ies) based upon code provisions. Show your math, and code references for these adjustments
- ❑ Relative elevation of sprinklers, junction points and supply or reference points
- ❑ If room design method is used, all unprotected wall openings throughout the floor protected

- ❑ System elevation relative to grade and other sprinkler heads, junction points and supply or reference points
- ❑ Hazard or commodity classification
- ❑ Completed High-piled Packet #1 when applicable
- ❑ Edition year of NFPA 13 that the system was designed to
- ❑ Code Study

### **Additional information for High-Pile/High Challenge Systems**

- ❑ An owner's certificate in accordance with Chapter 4 of NFPA 13.
- ❑ The design criteria (NFPA 13, Factory Mutual Data Sheets, or a specific fire test report).
- ❑ The type of design (Control Mode Density/Design Area, Specific Application, Suppression Mode, etc.), including the appropriate code references.
- ❑ Description of the stored commodities and how the commodity classification was determined (High Pile Storage Questionnaire).
- ❑ A layout of the proposed storage arrangement. If the storage is in racks, a plan and elevation detail illustrating rack heights, flue dimensions and arrangement (not required for spec warehouses).
- ❑ The aisle dimensions between each storage array.
- ❑ If a high challenge commodity is separated using fire-resistive construction, the boundary of the fire resistive construction shall be illustrated.
- ❑ A cross-section view illustrating obstruction to the ceiling sprinklers (lights, structural members, cable trays, electrical bus ducts, HVAC, etc.).
- ❑ Hazardous materials inventory statement, if applicable.
- ❑ For flammable and combustible liquids, an analysis of the miscibility of Class I liquids, the size and type of packaging, the packaging materials of construction, and if the containers have a pressure relieving mechanism.
- ❑ For Level 2 or 3 aerosols, a statement indicating that the aerosols are cartoned or uncartoned.

# Appendix B

## Information Required on Hydraulic Calculations

### Summary Sheet

- Date, location, name of occupant, owner and building number or other pertinent identification (i.e., suite number)
- Name, address and phone number of installing contractor and designer
- Description of hazard/commodity classification
- Specific NFPA reference material for design density used in calculations
- Total water requirements for the system as calculated, including the allowance for inside hose and outside hydrant
- Total water requirements for the system as calculated, at the base of the riser (system gauge) and the city side gauge below the backflow
- Allowance for in-rack sprinklers, GPM where applicable

### System design requirements

- Design area in ft<sup>2</sup>
- Minimum density in GPM/ ft<sup>2</sup>
- Area of coverage per sprinkler in ft<sup>2</sup>
- Spacing of sprinkler heads. When using special sprinklers, be sure to also indicate the manufacturer's minimum flow and pressure requirements, or any other unusual requirements

### Detailed Worksheets – actual calculations

- Sprinkler description and K-factor
- Hydraulic coefficient used in calculations
- For gridded or looped systems, a sketch representing the flow quantities and direction for lines with sprinklers operating in the hydraulically most remote area (i.e., peaking of grid)
- Page numbers on every page
- Pipe size (actual internal)
- Pipe lengths (center-to-center of fittings)
- Equivalent pipe lengths for all fittings and devices used in calculations
- Friction loss in psi per foot of pipe
- Total friction loss between reference points
- Elevation head in psi at each reference point
- Velocity pressure and normal pressure if included in calculations
- Nodes to indicate hydraulic reference points, reference to other sheets, or to clarify data shown.
- Flow in GPM
- In-rack sprinkler demand balanced to ceiling demand
- Required pressure in psi at each reference point
- Combined K-factor calculations for sprinklers on drops, arm-overs, or sprigs where calculations do not begin at the sprinkler

## Water Supply Summary

- ❑ Location and elevation of static and residual test hydrants with relation to the riser reference point.
- ❑ Static pressure in psi.
- ❑ Residual pressure in psi.
- ❑ Pitot pressure in psi (if known).
- ❑ Resulting flow in GPM. A theoretical flow model must be obtained from Colorado Springs Utilities. Projects with new water infrastructure and hydrants should use theoretical flow for new hydrants to avoid unnecessary friction losses for excessive amounts of underground piping. The Civil Engineer preparing plans for the new water infrastructure should have theoretical fire flows for these new hydrants.
- ❑ Diameter of flowing orifice in inches.
- ❑ Graphic representation showing the water supply curve and system requirements, including hose demand when applicable plotted on semi-exponential graph paper (also known as N1.85 or hydraulic paper) so as to present a graphic summary of the complete hydraulic calculation. This graph shall include the following:
  - ❑ Water Supply curve.
  - ❑ Sprinkler system demand.
  - ❑ Hose demand.
  - ❑ In-rack demand, if applicable.
  - ❑ Fire pump points (churn, rated, 150%).
  - ❑ Flow orifice diameter in inches.

## Appendix C

### Sample Signage for High Pile/High Challenge Systems:

#### Automatic Sprinkler System Capabilities & Limitations

<b>Stored Commodity</b>	Class I water miscible flammable liquids in 1- & 5-gallon polyethylene containers in fiberboard cartons
<b>Design Documents</b>	NFPA 13 2019 edition & NFPA 30 2018 edition, Table 4.8.2(g) and section 4.8.6.2 (Scheme B)
<b>Design Type</b>	Control Mode, Density/Area Method
<b>Max Storage Height</b>	25 feet
<b>Min. Aisle Width</b>	8 feet
<b>Max. Rack Width</b>	9 feet
<b>Flue Dimensions</b>	Longitudinal: Min 6-inches Transverse: Min 3-inches
<b>System Capabilities</b>	Class I-IV commodities, stored commodity, solid pile or palletized Group A plastics to 12 feet; rack storage of Group A plastics to 25 feet.
<b>System Limitations</b>	No level 2 or 3 aerosols, Class 2, 3 or 4 Oxidizers
<b>Idle Pallets</b>	6 feet max storage height
<b>Tire Storage</b>	5 feet max storage height
<b>Roll Paper Storage</b>	5 feet max storage height
<b>In-Rack Sprinklers</b>	In-rack sprinklers are Tyco/Central FS-B, 17/32" orifice, QR 155°F element, SIN TY0041
<b>Horizontal Barriers</b>	Required at each rack tier containing the stored commodity
<b>Ceiling Sprinkler</b>	Tyco ELO-231B, 3/4" orifice, SR 286°F element, upright, SIN TY0030

# Appendix D

## Elevators and Fire Sprinkler/Fire Alarm Requirements

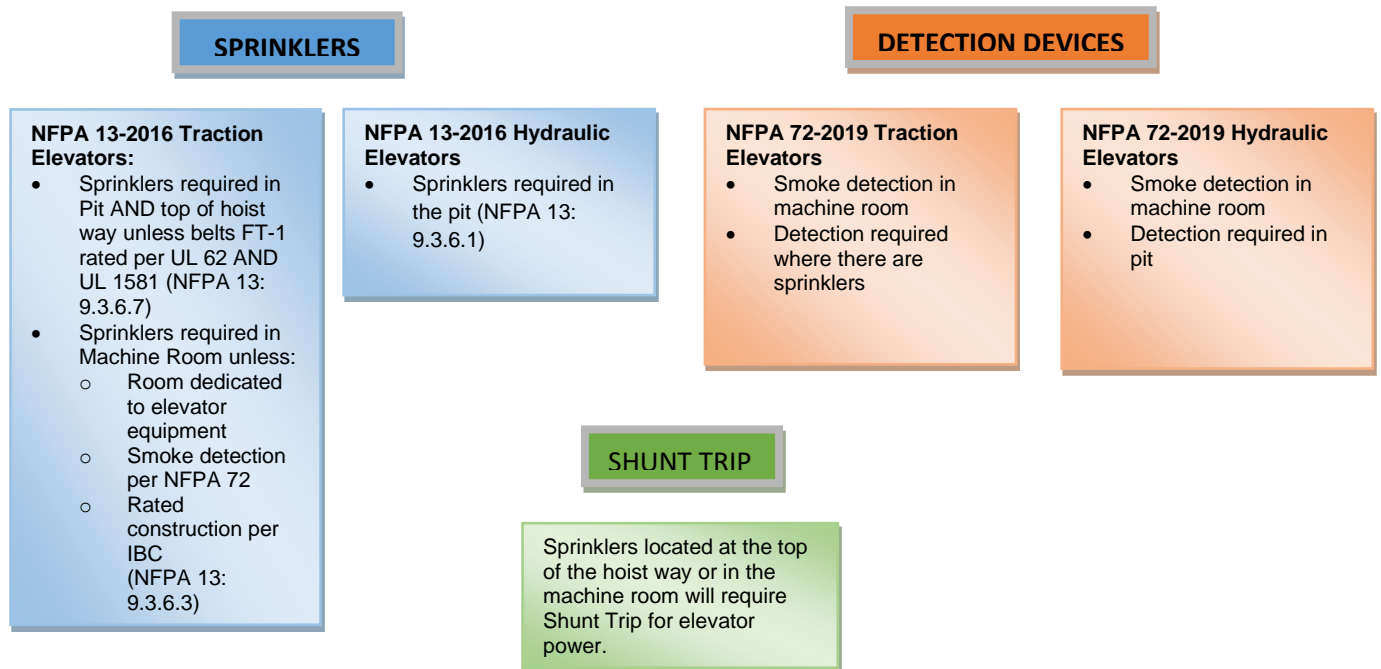
Codes: 2019 NFPA 13  
 2019 NFPA 72  
 2015 IFC

With changes in elevator technologies, the fire sprinkler and fire alarm requirements are continually trying to keep up. Different elevators have different requirements. Even different sprinkler systems have different requirements.

Buildings protected by NFPA 13R and 13D sprinkler systems do not have any special requirements when it comes to elevator protection.

2019 NFPA 13R 6.6.6: Sprinklers are not required in elevator machine rooms or shafts, where the elevator installation complies with ANSI A17.1 (Elevator code)

2019 NFPA 13D 8.3.5: Sprinklers are not required in elevator machine rooms or shafts.





## Appendix E

### CSFD Construction Services 20 Head Letter Template

Company Information:

Date:

Project Name and Address:

Area of work in the building:

CSFD Plan Review #:

PPRBD Permit #:

System Work Only

Reason for work:

Remodel

Deficiency

Check one for design basis:

NFPA 13

NFPA 13D

NFPA 13R

System Type:  Wet

Dry

Pre-Action

Deluge

Check one for design criteria:

Hydraulically Calculated

Pipe Schedule

Number of heads:

Added

Relocated

Plugged

Sprinkler head information: K-factor

Temp.

Thread Size

Flex Connections:

YES

NO

Brand:

Equivalent Length:

UL 2443/FM 1637 Complaint:

Work is scheduled to start:

Work is scheduled to be completed by:

Scope of work:

Check to acknowledge that a sketch for the scope of work has been provided.

Signature and date by Contractor's RME:

*By providing the installing company's responsible managing employee's signature it is acknowledged that the water supply is of sufficient capacity and no hydraulic overloading exists. It is, also, acknowledged that the system will be installed in accord with all applicable local and notional codes and standards.*