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# DESIGN, INSTALLATION AND MAINTENANCE OF AUTOMATIC FIRE SPRINKLER SYSTEMS (AFSS); 2019, 2010 CBC

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**Disciplines:** Fire and Life Safety

**History:** Revised 04/25/22 Under 2019 CBC  
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Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

## **PURPOSE**

This Interpretation of Regulations (IR) clarifies who is qualified in California to design, install, and maintain automatic fire sprinkler systems (AFSS) for projects under the jurisdiction of DSA, according to the requirements of the Contractors State Licensing Board (CSLB) and applicable referenced standards.

### **1. GENERAL REQUIREMENTS**

Any AFSS, both underground and overhead portions, submitted to DSA for approval shall meet the following requirements.

#### **1.1 Design Professional (DP)**

For this IR, the architect or engineer in general responsible charge [sometimes called the Architect of Record (AOR) or the Engineer of Record (EOR)] shall be referred to as the “design professional” (DP).

The DP is always responsible for the design and construction oversight and must coordinate the pipe sizes and designs with hydrant requirements and the anticipated demand of the fire sprinkler system(s) that will be fed by the underground piping.

##### **1.1.1 Fire Protection Engineer (FPE)**

An FPE is an individual licensed in the state of California and able to design underground or overhead portions of an AFSS.

##### **1.1.2 Contractors**

Contractors holding a Class A (General Engineering Contractor), Class C-16 (Fire Protection Contractor), Class C-34 (Underground Piping Contractor) or Class C-36 (Plumbing Contractor) contractor’s license may design and install systems, within the parameters of their license, if the systems designed are installed by that contractor or employees under the supervision of the license holder. Such systems may not be installed by another company or individual not professionally associated with the licensed design/build contractor.

##### **1.1.3 Subcontracting of Design or Installation**

Subcontracting of either the design or installation portion of the AFSS by the contracted General A, C-16, C-34, or C-36 licensed contractor must follow the parameters of Contract Law.

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However, the original licensed General A, C-16, C-34, or C-36 contractor shall remain the supervisor and must retain liability and insurance responsibility for both design and construction.

### 1.1.4 Design/Build Contractor

For the purposes of this IR, a design/build contractor is a contractor with a General A, C-16, C-34, or a C-36 contractor's license who submits a bid for a contract, is subsequently awarded a contract to design, and then builds to that design a portion or portions of an AFSS. A C-16 contractor may design/build underground, backflow preventers, double detector check valves, gate valves, hydrants, fire pumps and/or other pressure reducing or increasing devices, and overhead portions of the AFSS. A General A and a C-34 contractor may design/build the underground portion, including exterior (outside of the building) backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing devices of the AFSS. A C-36 contractor may design/build the underground portion, from the property owner's side of the utility meter to the structure or fixed work, (outside of the building) including backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing devices of the AFSS.

### 1.2 Construction Documents

When the DP utilizes construction documents prepared by other professionals, the DP must stamp and sign those documents. In lieu of the signature and seal (or stamp) of the DP, DSA will accept the Statement of General Conformance from the DP. See Appendix A and B of DSA *IR A-18: Use of Construction Documents Prepared by Other Professionals*.

### 1.3 Water Supply Data

Water supply data must be included with the initial plans and specification submittal per current edition of National Fire Protection Association (NFPA) 13 as adopted and amended. Systems that require fire pumps, water tanks, or other measures to provide required water flow and/or pressures must be submitted with the AFSS plans.

Water flow test data must indicate the volume and pressure available for the AFSS design. Test data must be dated and may not be older than six months from the date of submittal of project documents to DSA. Submittal of test data to DSA shall be "wet" signed by the water purveyor or the local fire authority that conducted or witnessed the test.

For the purposes of design, computer modeled data is acceptable. Where computer modeled data is submitted, the design flow and pressure shall be field verified by actual flow test prior to project completion.

For fire flow testing criteria during declared drought conditions, refer to DSA Bulletin (*BU*) 15-02: *Water Flow Tests for Fire Protection Systems During Drought Conditions*.

### 1.4 Plans

Plans and hydraulic calculations shall include the applicable information as outlined in Chapter 23 of NFPA 13, including the information in following sections 1.4.1 through 1.4.7 below. (For a more detailed guideline and additional required information see DSA Guideline (*GL*) 1: *Automatic Fire Sprinkler Systems (AFSS) Project Submittal Guideline*.)

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**Note:** The term “elevation” in the following is used to mean the depth or height of equipment or features noted on plans as a point above or below finished floor where the underground piping supplies the AFSS riser or risers.

### 1.4.1 Test Hydrants

Test hydrants, static and residual, must be located and identified, including the hydrant elevations.

### 1.4.2 Water Supply

Location and elevation of main feeds at point of connection with public water supplies, water tanks or other water supplies approved by DSA. Hydraulic calculations must include all points of connection, devices, valves, or other equipment that affects the water flow and pressure.

### 1.4.3 Devices and Valves

The locations and identification (by type, size, model, and manufacturer) of all backflow preventers, double detector check valves, gate valves, hydrants, fire pumps and/or other pressure reducing or increasing devices shall be noted on the plans. Manufacturer’s product data sheets shall be provided with the submittal. Pressure reducing or increasing component manufacturer’s product data sheets shall include the GPM/PSI flow charts, curves, and any other documentation to confirm the reduction or increase of pressures. Provide dimensioned details of all components, including elevations, methods of support, supervision (monitoring), securing, freeze protection and working clearances for firefighters.

### 1.4.4 Piping

Indicate all elevation changes, turns, pipe size or type changes and indicate the type of fittings (long elbow, tee, etc.) used.

Plans associated with the underground piping shall indicate if corrosive soils are present. Provide a copy of a soils report for verification.

Changes to the proposed piping plans, due to unknown site conditions or other reasons, must be submitted to DSA via the DSA Construction Change Document (CCD) process (see *IR A-6: Construction Change Document Submittal and Approval Process*). Additional or supporting documentation may be required before approval is granted.

### 1.4.5 Anchoring of Piping

Methods of securing piping (thrust blocks, restraining rods, joint systems, etc.) must be per NFPA 13 and/or NFPA 24. Details of all types of restraint shall be provided on the plans.

Thrust block calculations shall be based upon a minimum soil bearing capacity of 1500 pounds per square foot (PSF). Submitted soils reports that certify undisturbed soil bearing capacity with a higher value may be used to calculate the thrust blocks. The report must graphically identify the areas where the test data was taken and must include the location(s) of the proposed piping.

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### **1.4.6 Risers**

Riser locations shall be identified for all AFSS systems.

### **1.4.7 Building Identification**

All buildings shall be identified and given numerical or alphabetical designations. These building designations shall be carried forward on all documents for the life of the construction project for continuity and ease of identification.

## **2. UNDERGROUND PORTION**

### **2.1 Who May Design?**

A California registered civil engineer, a registered mechanical engineer, or a Class General A, Class C-34 or C-16 Licensed Contractor may design underground piping plans for submittal to DSA, including exterior (outside of the building) backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing device, within the parameters of their license. A C-36 licensed contractor may design/build the underground portion, from the property owner's side of the utility meter to the structure or fixed work, (outside of the building) including backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing devices of the AFSS. Designs prepared by registered civil or registered mechanical engineers must be stamped and signed. All systems must comply with NFPA 13 and/or NFPA 24, as amended in the CBC. (See Section 1.2 above).

### **2.2 Who May Install?**

A civil engineer, mechanical engineer, Class General A or Class C- 34 or C-16 licensed contractor is authorized to install the underground portion of the system, including exterior (outside of the building) backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing device within parameters of their license. A C-36 may install the underground portion, from the property owner's side of the utility meter to the structure or fixed work, (outside of the building) including backflow preventers, double detector check valves, gate valves, hydrants, fire pumps, and/or other pressure reducing or increasing devices of the AFSS, within the parameters of their license. (See Section 5 below) California registered civil engineers or registered mechanical engineers shall cause underground piping to be installed under their direction and supervision.

## **3. OVERHEAD PORTION**

### **3.1 Who May Design?**

The above ground portion of the system may be designed by a mechanical engineer or fire protection engineer, or a design/build C-16 licensed Fire Protection Contractor, per Title 16, CCR Section 832.16, and California Business and Professions Code Sections 7057 & 7058.

### **3.2 Who May Install?**

All systems must comply with NFPA 13 as amended in CBC. Installation of overhead portions of Automatic Fire Sprinkler Systems shall be as follows: If an above ground system is designed by

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a mechanical engineer or fire protection engineer, any C-16 licensed fire protection contractor can install the system, per CCR, Title 16 Section 832.16 and California Business and Professions Code Sections 7057 & 7058.

### 4. MAINTENANCE OF THE SYSTEM

Pursuant to the Business and Professions Code Section 7048, and NFPA 25, 2013 California Edition, the State Fire Marshal requires a class "A" Licensed company (Automatic Extinguishing Systems concern) to repair or replace those system components up to a \$500 dollar limit (for labor, materials, and all other items) as specified by the CSLB. Individuals performing maintenance must have a C-16 license to perform the required five year maintenance.

**4.1** Acceptance or performance testing of an electric fire pump requires the individual performing the testing to have a C-16 or a C-10 License.

**4.2** Owners may perform the monthly inspections.

**4.3** Warranties may be compromised if systems are not maintained according to recognized standards and manufacturer's guidelines.

### 5. FIRE EXTINGUISHING SYSTEM CERTIFICATION

Effective July 1, 2018, all automatic fire extinguishing system (AES) sprinkler pipefitters that install, alter or repair water-based fire protection systems must be certified by Cal Fire-Office of the State Fire Marshal. (See Cal Fire- OSFM Information Bulletin 17-002 for implementation guidance).

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#### REFERENCES:

California Code of Regulations (CCR), Title 24  
Part 1, California Administrative Code Sections 4-209, 4-225 (c) and 4-316(e)  
NFPA Standards 13 and 24, 2010 through 2016 editions, as amended  
California Business and Professions Code, Sections 6737.1, 7026.12, 7057 & 7058  
C.C.R., Title 16, Professional and Vocational Regulations, Section 832.16  
C.C.R., Title 19, Regulations of the State Fire Marshal Health & Safety Code 13195 & 13196.5

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This IR is intended for use by DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (K- 12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is subject to revision at any time. Please check DSA's website for currently effective IRs. Only IRs listed on the webpage at [www.dgs.ca.gov/DSA/Publications](http://www.dgs.ca.gov/DSA/Publications) at the time of project application submittal to DSA are considered applicable.