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## DESIGN, INSTALLATION AND MAINTENANCE OF AUTOMATIC FIRE SPRINKLER SYSTEMS (AFSS)

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# IR A-25

References:

California Code of Regulations (CCR), Title 24  
Part 1, California Administrative Code Sections 4-209, 4-225 (c) and 4-316(e)  
2002 and 2010 NFPA 13 and 24  
California Business and Professions Code, Sections 6737.1, 7026.12, 7057 & 7058  
C.C.R., Title 16, Professional and Vocational Regulations, Section 832.16  
Health & Safety Code 13195 & 13196.5

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Discipline: Fire and Life Safety

This Interpretation of Regulations (IR) is intended for use by the Division of the State Architect (DSA) staff, and as a resource for design professionals, to promote more uniform statewide criteria for plan review and construction inspection of projects within the jurisdiction of DSA which includes State of California public elementary and secondary schools (grades 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 reviewed on a regular basis and is subject to revision at any time. Please check the DSA web site for currently effective IRs. Only IRs listed in the document at <http://www.dgs.ca.gov/dsa/Resources/IRManual.aspx> at the time of plan submittal to DSA are considered applicable.

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**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 the Division of the State Architect (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 the purpose of 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 at all times 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:** A Class A (General Engineering Contractor), Class C-16 (Fire Protection Contractor), Class C-34 (Underground Piping Contractor) Class C-36 (Plumbing Contractor) contractors may design and install systems, within the parameters of their license, as long as 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:** Sub-contracting 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. 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 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, such as a Fire Protection Engineer, a Class A (general Engineering Contractor), C-16 (Fire Protection Contractor), Class C-34 (Underground Piping Contractor), or a C- 36 (Plumbing Contractor) 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](#).

**1.3 Water Supply Data:** Water supply data must be included with the initial plans and specification submittal per current edition of the NFPA 13. Systems that require fire pumps, water tanks, or other measures to provide required water flow and or pressures must be pre-approved by DSA and submitted with the AFSS plans.

Water flow testing data must indicate the volume and pressure available for the AFSS design. Testing data must be dated and may not be older than 6 months from the date of submittal of documents to DSA. Submittal of test data to DSA shall be "wet" signed by the Water Purveyor, or by the Local Fire Authority that conducted or witnessed the test.

**1.4 Plans:** The following information shall appear on all plans. (For a more detailed guideline, and additional required information see "[Fire and Life-Safety Plan Review Submittal Guidelines – AFSS](#)" on the DSA Web Site.)

**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 grade 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, 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, and pipe size or type changes for underground piping, and indicate the type of fittings (long elbow, Tee, etc.) used in the underground piping plans.

Changes to the proposed piping plans, due to unknown site conditions or other reasons, must be submitted to DSA via the DSA Change Order process (see [IR A-6](#)). 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, etc.) must be per NFPA 13 and/or NFPA 24. Details of all types utilized shall be provided on the plans.

Thrust block calculations shall be based upon a 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.

- 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, with in 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 2002 or 2010 NFPA 13 and/or NFPA 24 (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, with in the parameters of their license.

California registered civil engineers or registered mechanical engineers may 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 2002 and 2010 NFPA 13 Section 3.2.1. and/or NFPA 24. Installation overhead portions of Automatic Fire Sprinkler Systems shall be as follows:

If an above ground system is designed by a Mechanical Engineer or Fire Protection Engineer, any C-16 licensed Fire Protection Contractor can install the system, per Title 16, CCR., Section 832.16 and California Business and Professions Code, Sections 7057 & 7058.

**Note:** "Piping installers need not be certified if employed by and working under the supervision of the contracted C-16 licensed Fire Protection Contractor."

**4. Maintenance of the System:** Pursuant to the Business and Professions Code Section 7048, and 2006 California edition of NFPA 25, the State Fire Marshal requires a class "A" Licensed company (Automatic Extinguishing Systems Concern) to repair or replace those system components up to \$500 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 (5) 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.