

# RESIDENTIAL FIRE SPRINKLER/WATER PURVEYOR TASK FORCE

## FINAL REPORT/RECOMMENDATIONS

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## Message from the Acting State Fire Marshal

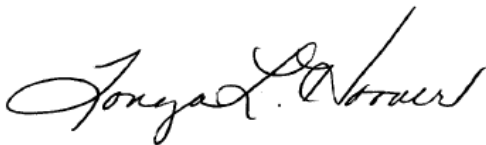
We, at the Office of the State Fire Marshal, highly value collaboration and information sharing with our stakeholders to achieve positive support and impact on fire and life safety issues. This report is an example of such effort and dedication and is a testimony to how diverse groups and professionals with a universal interest of public protection will work together on common goals. Additionally, the recommendations are essential to the successful understanding of the statewide residential fire sprinkler adoption movement within the California Building Standards and will be used as part of that decision making process.

From January 1, 2003 to February 1, 2008 over 54,400 residential structure fires were reported to the Office of the State Fire Marshal, National Fire Incident Reporting System (as reported by 48 percent of the fire departments in the State). There were 410 civilian residential deaths, 3 firefighter fatalities and approximately \$2.3 billion dollars in property loss due to fire. Nationally in 2007 there were 414,000 residential structure fires with 2,895 deaths, 14,000 injuries, and \$7.5 million of direct dollar loss. Eighty-four percent of all civilian fire deaths nationally occurred in residences.

We can make an impact at eliminating residential fire deaths and provide an equal level of fire protection to all of California's citizens by moving forward with a statewide residential fire sprinkler code adoption. This report is Phase I of a three-phase approach of this movement to protect life and property. The Phase II task force has concluded and their report will be posted as well. The Phase III task force is currently in process with a tentative completion date of December, 2009.

I wish to thank the Task Force Co-Chairs (Chief Dennis Mathisen and Chief Ernie Paez), members and organizations for their dedication and commitment to this important project. The CAL FIRE – Office of the State Fire Marshal appreciates everyone's willingness to share their time, energy, and talent; particularly during these difficult fiscal times. Through our partnerships we will continue to move the fire and panic safety forward, providing a safer working environment for emergency responders and a safer environment for all those who live and visit California.

Sincerely,



TONYA L. HOOVER  
Acting State Fire Marshal

## Acknowledgements

This report was developed through the culmination of many hours of in-depth research and analysis through outstanding collaborative efforts of the many disciplines involved with the Office of the State Fire Marshal **Residential Fire Sprinkler/Water Supply Task Force**.

This collaborative effort included the California Office of the State Fire Marshal, National Fire Protection Association, Northern California Fire Prevention Officers Association, Southern California Fire Prevention Officers Association, American Water Works Association, California Housing and Community Development, California Building Industry Association, League of California Cities, East Bay Municipal Water District, California Building Officials, Desert Water Agency, California Department of Public Health, City of Roseville Water Utility, Los Angeles Department of Water and Power, Sacramento Metro Fire District, Roseville Fire Department, Riverside County Fire Department, International Association of Plumbing and Mechanical Officials, University of Southern California, National Fire Sprinkler Association

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*The Office of the State Fire Marshal thanks each member and their organizations for their assistance with this important work.*

## Preface

This document is Part 1 of a 3 part series regarding issues related to the adoption of regulations in preparation for a statewide residential fire sprinkler requirement for new construction scheduled for implementation January 1, 2011. This part is known as the ***Residential Fire Sprinkler/Water Purveyor Task Force***.

On October 9, 2008, the Office of the State Fire Marshal convened representatives from various disciplines related to water supply and how it relates to residential fire sprinklers. The purpose of the Residential Fire Sprinkler/Water Purveyor Task Force was to provide information and suggested recommendations to the State Fire Marshal on all water supply issues related to residential fire sprinkler systems and to recommend strategies for solutions.

Our key stakeholders include members of the California Fire Service, Building Industry, Building Officials, Water Purveyors, American Water Works Association, Public Health Officials, State agencies, National Fire Protection Association, National Fire Sprinkler Association and the California League of Cities.

**It is recommended that the reader review Health & Safety Code 116270 – 116820, American Waterworks Association Manual 14 & 31, and Residential Fire Sprinkler Manual NFPA 13D.**

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## Executive Summary

On October 9, 2008, the Office of the State Fire Marshal convened representatives from various disciplines related to water supply and how it relates to residential fire sprinklers. The purpose of the **Residential Fire Sprinkler/Water Purveyor Task Force** was to provide information and suggested recommendations to the State Fire Marshal on all water supply issues related to residential fire sprinkler systems and to recommend strategies for solutions. This is in preparation for a statewide residential fire sprinkler requirement for new construction scheduled for implementation January 1, 2011. For the purpose of this project the group identified the following definition of residential construction to apply to detached one-and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress. (Note: This definition comes from the International Residential Code.)

## Stakeholders

Our key stakeholders include members of the California Fire Service, Building Industry, Building Officials, Water Purveyors, American Water Works Association, Public Health Officials, State agencies, National Fire Protection Association, National Fire Sprinkler Association and the League of California Cities. For complete rosters of individual members and interested individuals please see **Appendices A and B**.

## Process

The Task Force convened monthly in both northern and southern California. A variety of methods were utilized to accommodate those members not physically able to attend. Conference calls and Internet based meeting technologies such as GoToMeeting were used successfully to ensure thorough communication.

A more complete understanding of each stakeholder's interests and concerns was achieved. Key elements and outcomes of this process were relationship building and education afforded to all parties.

The Task Force identified four primary goals, which included:

1. Identify issues related to residential fire sprinklers and water supply.
2. Recommend solutions.
  - a. Potential legislative/administrative law action
  - b. Training and education
3. Identify applicable statutes/regulation and conflicts.
  - a. Water purveyor
  - b. Fire service
4. Identify cost offsets/incentives.
  - a. Infrastructure
  - b. Building and Fire Codes

The group was formed into four sub-groups (See [Appendix C](#)) so that key issues could be evaluated in detail taking into consideration the Task Force's primary goals. The groups and initial issues included, but were not limited to:

- **Fees**

- Cost/fees (initial fees/on-going fees; aka standby fees)
- Conflict between PUC and special districts – who regulates fees?
- Fee methodology
- Applicability of AB 1600

- **Connection Configuration**

- Type/listing of meter
- Meter sizing/arrangement
- Water supply criteria – flow/pressure/duration
- Back flow cross connection
- Rural vs. municipal water supply
- Pressure regulations (low/high/changes)
- Potable water vs. purple water
- Liability issues
- Meter vs. no meter (preferred vs. optional connection)
- Consistency

- **Laws and Regulations**

- Liability and legal issues
- Water purveyor shutting off water supply for non-payment
- Potential legislative/ administrative law action?

- Identify applicable statutes and regulation and conflicts
  - Water purveyor
  - Fire service
- **Process Efficiencies & Cost Impacts**
  - Identify cost offsets/incentives (infrastructure and building/fire code/insurance rates)
  - Plan review/inspection practices
    - Building
    - Fire
    - Water

Each sub-group was tasked with presenting their specific topical issues and making recommendations to the Task Force. In order to ensure thorough evaluation of the issues, a specific decision making model was utilized. This model is known as the **STEEP** Decision Making Model considering the following factors: **S**ocial - **T**echnological - **E**conomical - **E**nvironmental - **P**olitical.

This model allows the user to:

- Isolate your decision to create the issue.
- Investigate the issue from all sides.
- Refine the question regarding the issue.
  - What do we need to solve?
  - Positive or negative impacts?
- Look at key factors.
  - STEEP analysis
- Rehearse the implications.

As each sub-group formulated their sections of the final report, this decision making model was used within the report format where appropriate. In other words, the model format worked well for the Fee and Connection Configuration sub-groups, but not the other sub-groups.

## **Task Force Results and Recommendations**

Over the course of an eight month period the Task Force and four sub-groups met and produced the following results and recommendations for submission to the California State Fire Marshal.



## FEE SUB-GROUP

### INTRODUCTION

The Fee Sub-Group evaluated a variety of residential sprinkler system design and water supply issues that affect fees and charges at the local jurisdiction level. Fire agencies and water purveyors generally strive for consistency within their industries when possible; however, each jurisdiction may have unique needs. The following recommendations focus on Best Management Practices and encourage standardization whenever possible.

### PHASE I RECOMMENDATIONS

1. Use the Best Management Practices (BMP) Philosophy when applicable for making recommendations and suggestions for specific applications that are appropriate for the conditions within a specific region of California.
  - a. Social: This will provide water purveyors information regarding what is being done throughout the State of California. Best practices will ultimately improve the quality of life by providing the best possible water service, and fire and life-safety with practices developed in accordance with a best practice standard.
  - b. Technological: Allows stakeholders to share and to utilize the best technological standards throughout the State giving the best value for the consumers.
  - c. Economical: Should insure that residents are protected from higher fees through sharing BMP billing among water purveyors throughout the State of California.
  - d. Environmental: Provides the greatest opportunity to place water quality at the forefront while sharing best practices with stakeholders throughout California.
  - e. Political: Establishment of BMP within the water purveyor industry builds trust with consumers and enables shared interests in forming alliances with stakeholders in the Fire Protection Industry to promote the fire sprinkler concept while allowing local control and decision making.

2. Eliminate as a BMP and in accordance with NFPA 13-D, the combination of the domestic and fire sprinkler flows when calculating flows for service sizes. This recommendation reduces the flow requirement and allows meter service sizing accordingly.
  - a. Social: Allows for a more cost efficient way of adequately protecting the consumer.
  - b. Technological: Technology is available (such as Residential Domestic Shutoff Valves and other similar devices) when needed for conditions that require redirection of the water flow from the domestic to the fire sprinkler system to meet conditions where water pressure and flow is not sufficient to meet the combined demand. This technology can be utilized to eliminate the necessity for increased over sizing of the meter and service line.
  - c. Economical: Reduction in meter sizes reduces builder and water purveyor cost and makes the Fire Sprinkler Concept more affordable to the consumer.
  - d. Environmental: BMP in line (b.) result in fewer raw materials needed to construct service laterally and reduces meter size.
  - e. Political: Reduction in the service laterally and meter size is a cost benefit to the consumer and becomes a political asset for the local constituents.
  
3. Develop a BMP Philosophy/Program for the State of California that determines fees technology, maintenance, inspection, service, and monthly standby or utility fees used in billing consumers with residences that are constructed with NFPA 13-D Residential Fire Sprinkler Systems.
  - a. Social: Increases fire and life safety and quality of life in California by making the systems more affordable and consistent in application among jurisdictions.
  - b. Technological: No technological impact
  - c. Economical: Consumers would be assessed for costs of water service similarly throughout the state with exceptions for situations that require extraordinary measures to meet existing conditions.
  - d. Environmental: No environmental impact
  - e. Political: Increases public acceptance of the residential fire sprinkler concept by the use of a statewide Best Practice Standard for establishing fees nexus and like treatment for residences constructed with NFPA 13-D Residential Fire Sprinkler Systems.

4. Encourage the use of flow-through designs as a BMP, to minimize the need for backflow prevention. Support a detailed and thorough study of the risk and benefit of backflow prevention through an industry study.
  - a. Social: Looped or other approved means provides a measure of safety that will protect the water supply from future/unknown water contaminates.
  - b. Technological: The technology is built into the NFPA 13-D standard through the use of looped systems or other means for creating periodic water flow such as tying the system into a frequently used plumbing device. Tying the system into a plumbing device ensures that the residential fire sprinkler system is charged with water at all times.
  - c. Economical: Eliminates the need for backflow devices and related fees through the simple means of looping the piping system or tying the system into a frequently used plumbing device.
  - d. Environmental: Has the potential to better protect the public water supply.
  - e. Political: Reduces the concern that residential fire sprinkler systems may contaminate the public water supply without creating an additional expense to the consumer and promoting confidence in water supply integrity.

## **POTENTIAL PHASE II RECOMMENDATIONS**

1. Recommend a statewide best practice for calculating fees for plan review by enforcing agencies of NFPA 13-D Residential Fire Sprinkler systems.
  - a. Social: Communicates that plan review fees throughout the State of California are in accordance with a best practice standard and consistent with other agencies thus promoting the Fire Sprinkler Concept and improving the quality of life and safety throughout the state.
  - b. Technological: Will share the best technological standards with water purveyors throughout the State giving the best value for the consumers
  - c. Economical: Provides consistency in plan review fees throughout the state insuring that system design and plan review costs are similar and in accordance with a BMP standard.
  - d. Environmental: Will provide the best opportunity to keep water quality at the forefront while sharing best practices throughout the state.

- e. Political: Reduces differences between system design and review processes between agencies making it easier to understand and comply with requirements for residential fire sprinkler design and construction.
2. Identify common terminology used by stakeholders in the water purveyor and fire industry for use in all aspects of NFPA 13-d Residential Fire Sprinkler System construction and design.
    - a. Social: Assists public awareness by enabling citizens to better understand the residential fire sprinkler concept.
    - b. Technological: Allows the stakeholders to communicate on a similar plane.
    - c. Economical: Assists the public in quicker and easier understanding of what is constructed into their homes and what they are purchasing with their fire sprinkler systems.
    - d. Environmental: No impact
    - e. Political: Develops common communication, which will ease political communication among stakeholders throughout the state.
  3. Identify methods of periodic inspections of NFPA 13-D Residential Fire Sprinkler systems such as during major remodeling, and resale inspections of residences to ensure that the quality of the systems exists throughout the lifetime of the system.
    - a. Social: Improves life safety and quality of life by periodically performing maintenance and inspection of the fire sprinkler systems.
    - b. Technological: Insures that the technology constructed into the fire sprinkler systems operates when needed.
    - c. Economical: Reduces life and structure loss liability by increasing confidence that the fire sprinkler systems work when needed.
    - d. Environmental: Decreases the environmental footprint in the landfills from burned structures, reduces smoke emissions, and keeps the water delivery systems clear of fire contaminants.
    - e. Political: Demonstrates to constituents and consumers that jurisdictions are committed to the fire sprinkler concept and willing to perform periodic inspections to maintain the fire and life safety of their communities.

4. Identify and define liability protection for water purveyors with regard to NFPA 13-D Residential Fire Sprinkler Systems. *(Covered in the Laws and Regulations Sub-committee)*
  - a. Social: Protects society while reducing unnecessary lawsuits.
  - b. Technological: No impact
  - c. Economical: Reduces unnecessary lawsuits.
  - d. Environmental: No impact
  - e. Political: Eliminates the public perception that Residential Fire Sprinkler Systems are a legal liability to the water purveyors, fire agencies, local communities and consumers.

## CONNECTION CONFIGURATION SUB-GROUP

### INTRODUCTION

A water supply connection, whether provided by a quasi-governmental agency, public utility, or private supply source, supplies water for public and private uses and must always consider health, safety and economics. Configuration of connections is provided to supply adequate pressure and flow as economically and reliably as possible.

### PHASE I RECOMMENDATIONS

1. Recommends a configuration with the following characteristics:
  - a. Single lateral feed from main; branching from the domestic supply to the meter. Least cost, simplest design, provides greatest flexibility.
  - b. Service sized based upon sprinkler demand and/or domestic (including irrigation) demand – worst case, without concern for simultaneous demand. Issues of designing to minimize simultaneous demand by requiring private domestic shutoff valve complicates household design but it is an option open to the individual agency. 1-inch meters are generally acceptable if based on these criteria.
  - c. Service lockout as per agency policy. Shutoff ability is required by the water purveyors for a variety of reasons. Agencies should use best practice to word shutoff notices to include potential loss of fire sprinkler protection and take appropriate measures to limit potential liability associated with discontinuing fire protection service. (Consider alternate design and possible hold harmless clause as part of Phase II discussion.)
  - d. Metering per purveyor/agency policy (and commonly by guiding practices or statutes) with exemption from fire rating for residential application.
  - e. Include maximum flexibility in the service configuration, which allows agencies to use existing policies, procedures and time-tested material resulting in appropriate cost for long-term reliability.
  - f. Continue the water industry standard that facility costs are 100 percent captured in the fees directly associated with installation, maintenance, reading, and replacement of the meters.

Monthly billing prices should have clear nexus to both the fixed and variable cost of service provided and should remain a local purveyor policy issue.

- g. Include a design that allows for connection of the fire protection system to remote fixtures to insure flushing of the system as a result of typical and frequent use. This will allow consideration of elimination of a backflow device by insuring water remains flushed.
2. Recommendations for type/listing of meter; meter size/arrangement; meter versus no meter.
    - a. Social: Not applicable – the configuration has no impact positive or negative on society.
    - b. Technological: Current technology is available. Selection of particular meter and configuration to be in keeping with agency's policies and engineering requirements based on demand flows.
    - c. Economical: Configuration is a water purveyor decision based on cost and technical factors. Standby charges based on local rate structure developed on a case-by-case basis. Meter type and size directly impact the cost of maintenance and replacement of the meters but can be minimized through design considerations and design criteria (i.e. rating meters, separate connections, and backflow devices).
    - d. Environmental: Potential positive impact; reduces impacts of fires on the community.
    - e. Political: Variable in that size of service and meter will affect cost and that can raise questions like what is driving the meter size, for what benefit, and at what cost? Who should pay? Water purveyors charge the beneficiary, i.e., the customer. Sizing of the meter is based on maximum flow rate, which can be either the aggregate of domestic and fire sprinkler flow or one or the other, whichever is larger. Since cost, benefit, and configuration are all a function of independent agencies, political implications are intrinsically present.
3. Recommendations for rural versus municipal supply.
    - a. Social: No specific differences in terms of configuration.
    - b. Technological: Current technology is available though water supply capability may be quite different. Municipal is likely more reliable in terms of supply owing to larger base of resources to operate and maintain the system.
    - c. Economical: No difference in configuration, but supply facilities may be affected, e.g., onsite storage tank or large well flowing to the sprinkler flow if additive.
    - d. Environmental: Flexibility of configuration supports minimizing use of materials in construction.

- e. Political: Using best practices should be a positive impact in terms of life safety, but cost as noted in 3.c. may be a political issue for local jurisdiction.
4. Recommendations for backflow protection.
- a. Social: Optional backflow does not provide 100 percent guarantee of backflow protection, however, protection is in keeping with current level of overall protection.
  - b. Technological: Current backflow prevention technology is available. The main unknown is the issue of contamination of domestic water (both the specific home and public system from stale water in the sprinkler piping system). Solutions are available (if it is a problem), but not well studied. A key point is the number of opportunities for contamination will increase significantly if the requirement for sprinklers is ubiquitous. At present, no specific problems are obvious and some purveyors require residential backflow prevention as a result of water quality concerns.
  - c. Economical: Backflow prevention is a cost and requires annual maintenance and inspection. Typically, homeowner would pay for installation and maintenance and agency would inspect for a fee. Configuration alternatives would affect cost depending on size, type and location of the backflow prevention device.
  - d. Environmental: Minimizes use of materials in construction.
  - e. Political: By providing both Best Management Practices and local flexibility, political support is maintained. Recommend further study by industry (perhaps Water Research Foundation, Denver, Colorado).
5. Recycled water – not considered a necessary concern at this time as it is unlikely that this would be a cost-effective or even safe application of recycled water for residential even if an adjacent supply were available in that a dual system would be required (at home or both home and purveyor) and the issue of homeowner-performed plumbing and cross-connections would be a concern (nearly impossible to prevent or inspect).
6. Recommendations for water supply criteria – pressure/flow/duration.
- a. Social: Ensuring a coordinated approach to purveyor supply, configuration, and cost with other regulatory agencies (State and fire agencies) for an adequate water supply is in the best interest of the citizens.
  - b. Technological: Current technology is available. Water purveyors can ensure adequate flow and pressure by design. Duration is normally not an issue for an urban water purveyor as the distribution storage and pumping is driven by larger domestic demands of numerous customers and fire flows from hydrants



(typically at or about 500 to 1000 gallons per minute (gpm) for two hours in California, sometimes higher). Occasionally remote systems that are attached to urban systems function like rural systems. Rural systems will/may need special attention in all three of these components.

- c. Economical: Appropriate configuration minimizes pressure loss and therefore minimizes impact. Some low pressure services may require onsite hydropneumatic supplemental system beyond that required for domestic supply to adequately supply the sprinklers (and the domestic demand).
- d. Environmental: No significant independent impacts would be expected here other than those dealt with in developing the overall water supply, which is nearly always independent of this issue.
- e. Political: In some locations and cases, considerations in 4.b. and 4.c. could have political issues and concerns; so this would be variable and case-by-case.

#### 7. Recommendations for liability.

- a. Social: Potential liability issues are shutoff of fire protection services for non-payment may result in hazard level increase and backflow may create water quality issues.
- b. Technological: Not applicable.
- c. Economical: Liability exposure poses potential unknown economic impact. Water systems have inherent basic service liability and would not want to take on any additional liability for sprinkler systems.
- d. Environmental: Not applicable.
- e. Political: Water purveyors would not want to take on any additional liability for sprinkler systems. Homeowners, building inspectors, builders and contractors would have construction, testing and warranty liability, which is standard. Post-warranty, fire agencies and/or building officials would have annual inspection responsibilities if required and that may come with inherent liability. Ultimately, the homeowner is responsible, which seems to require some sort of formal notice regarding operations, maintenance, and standard inspection to ensure the system works. Also, agencies need to take measures as appropriate to notify customers of potential hazardous conditions created by potentially having fire protection services discontinued as a result of service shutoff.

8. Recommendations for consistency – although configurations may not be consistent from jurisdiction-to-jurisdiction, configurations would be flexible to situations and circumstances.
- a. Social: Consistency regarding Statewide BMP and statutory direction means all are treated equally with a clear social benefit (fire life safety) and this would be a benefit to the citizens.
  - b. Technological: Clear direction from the enforcing agency to the water purveyor is needed in terms of designing for the sum of both domestic and fire flow versus one or the other would clear up the technical configuration choices, meter system sizing and cost, or other technologies that would allow assurances that demands are directed where needed. Water purveyors will determine the design domestic flow and the fire agencies would determine the fire sprinkler flow.
  - c. Economical: Solving 8.a. and 8.b. would produce the most economical package for each specific housing development.
  - d. Environmental: Not applicable.
  - e. Political: If 8.a., 8.b. and 8.c. were in place with clear direction to the fire agencies throughout the State, the political views would likely be positive from all interested parties given the base assumption that the cost is justified by the benefit, life safety and structural and personal property damage minimization.

# PROCESS EFFICIENCIES & COST IMPACTS SUB-GROUP

## INTRODUCTION

The Process Efficiencies and Cost Impact Sub-Group evaluated several possible cost offset opportunities involving water supply infrastructure and potential code changes. The following describes the outcome of their discussion.

## PHASE I RECOMMENDATIONS

### **1. General Issues/Comments:**

- a. We need to identify and list the R-3 sprinkler trade-offs that already exist in the code.
- b. With regard to “non-code” offsets that are not under the direct purview of the Office of the State Fire Marshal (OSFM), we need to strategize on how best the OSFM can promote local jurisdiction acceptance of such offsets.

### **2. Infrastructure Offsets:**

- a. Increased Density: Department of Housing and Community Development (HCD)/Office of the State Fire Marshal should strongly consider moving the setback requirement for R-3's to 3-feet (as allowed via Uniform Building Code (UBC)) as opposed to the new 5-foot as allowed under the IRC. In addition, the OSFM (and HCD) may wish to develop a suggested “unit per-acre” increase to promote GB and recognize sprinkler installations.  
*(See Phase II Code change Recommendations)*
- b. Hydrant Spacing *(See Phase II Code change Recommendation)*
- c. Fire Apparatus Access Roadways *(See Phase II Code change Recommendation)*
- d. Narrower streets
- e. Longer cul-d-sacs and/or reduced turnaround radius  
Note: For 2-4, SFM should develop list of acceptable specs for use by the League of California Cities, California State Association of Counties and local jurisdictions.

### 3. Possible Code Changes:

- a. Reduced fire resistance rating between two adjacent dwellings and/or between home and garage.
- b. Egress benefits?

### 4. Water:

- a. Reduced fire flow (*See Phase II Code change Recommendation*)
- b. Single water line for both domestic and sprinkler system
- c. No separate meter for sprinkler system
- d. No fee increase for larger meter and special connection charge.
- e. No water stand-by fee

## Phase I Code Change Recommendations

### **{B.1.} SETBACK DISTANCE FOR GROUP R-3 OCCUPANCIES:**

#### **Initial Statement of Reason (ISOR):**

The 2001 California Building Code (CBC), Section 503.1 (page 1-51) states: *"Buildings shall adjoin or have access to a public way or yard not less than one side. Required yards shall be permanently maintained."*

Further, Section 503.2.1 General. states; *"Exterior walls shall have fire resistance and opening protection as set forth in Table 5-A and in accordance with such additional provisions as are set forth in Chapter 6. Distance shall be measured at right angles from the property line. The above provisions shall not apply walls at right angles to the property line."*

*"Projections beyond the exterior wall shall comply with Section 705 (page 1-69) and shall not extend beyond:*

1. *A point one third the distance to the property line from an assumed vertical plane located where fire-resistive protection of openings is first required due to location on property; or*
2. *More than 12-inches into areas where openings are protected."*

#### **Notes:**

- a. Table 5-A (page 1-58) Indicates for Group R-3, Type V-non-rated, that distance to property line is allowed to be non-rated when 3-feet or more and when less than 3-feet one-hour construction. It further indicates that openings are not permitted when less than 3-feet.
- b. Section 705 (page 1-69) defines projections as being "cornices, eave overhangs, exterior balconies, and similar architectural appendages."
- c. Section 705 (page 1-69) in the last paragraph refers the reader to Section 1204 Eaves. (page 1-137) which states; *"Where eaves*

*extend over required windows, they shall project no closer than 30-inches to any side or rear property line."*

The 2007 California Building Code (CBC), Section 602.1 (page 147) states; "Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of fire construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602."

Table 602 (page 150) shows that exterior wall Group R-3 Occupancies of less than 5-feet to property line shall have a fire-resistance rated exterior wall, and footnote "f" states; "*Group R-3, and Group U when used as accessory to Group R-3, shall not be required to have a fire-resistance rating where the fire separation distance is 5-feet or more.*"

**Notes:**

- a. Section 704.2 (page 155) defines "Projections" as:  
*"Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the floor area shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Section 1014.5 and 1023.1, respectively. Projections shall not extend beyond the distance determined by the following two methods, whichever results in the lesser projection*
  - 1) *A point one third the distance to the lot line from an assumed vertical plane located where protected openings are required in accordance with Section 704.8.*
  - 2) *More than 12-inches into areas where openings are protected."*

**Proposal:**

Consideration (by HCD/SFM) to develop an amendment to the CBC and/or IRC (2010 Edition) which would modify the provisions of Section 602.1 and/or Table 602 (and any other related Sections) to permit Group R-3 Occupancies to be constructed not less than 3-feet from adjacent property line without having a fire resistance rated exterior wall and openings be protected only if less than 3-feet from property line.

These changes would basically return the construction features for a Group R-3 Occupancy to what had been the norm under the 2001 CBC (1997 UBC) and prior editions, and would also recognize and give credit to the home builder for the installation of automatic fire sprinklers.

.....

**{B2} Fire Hydrant Spacing:**

2007 CFC Appendix C Fire Hydrant Locations and Distribution (page 521)  
(Entire Appendix Chapter is adopted by the SFM)

- a. Table C105.1 Number and Distribution of Fire Hydrants (page 521)

Note: This Table shows that for fire-flows of 1,750 or less the minimum number of hydrants required is one (1) and the average spacing between hydrants to be 500-feet.

- b. Section C105.1 Hydrant spacing (page 521) states: "*The average spacing between fire hydrants shall not exceed that listed in Table C105.1.*"

**"Exception:** *The fire chief is authorized to accept a deficiency of up to 10 percent (10%) where existing fire hydrants provide all or a portion of the required fire hydrant service."*

- c. Section 508.5.1 (pages 53-54) further states: "*Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official.*"

**"Exception:** *1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet."*

.....

**{B.3.} Fire Apparatus Access Roadways:**

- a. 2007 CFC Chapter 3 Fire Service Features. (Page 51) (Only specific Sections are adopted by SFM.)

**Special Note:** The sections listed below are not adopted by the SFM; however, most all of the local AHJ's adopt and enforce these Fire Code provisions.

- b. Section 503.1.1 Fire Apparatus Access Roads (page 51) states: "*Approved fire apparatus access roads shall be provided for every facility, buildings or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.*"

**Exception:** *The fire code official is authorized to increase the dimension of 150 feet where:*

1. *The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 (NFPA-13), 903.3.1.2 (NFPA-13R), OR 903.3.1.3 (NFPA-13D)."*
  2. *Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.*
  3. *There are not more than two Group R-3 or Group U occupancies."*
- .....

**{D.1.} Fire-Flow Requirements:**

2007 CFC Appendix B Fire-Flow Requirements for Buildings (page 517-18)  
(Entire Appendix Chapter is adopted by the SFM)

- a) Section B105.1 Fire-Flow Requirements for Buildings (One- and Two-Family Dwellings. (page 517)

**Note:** This Section states: *"The minimum fire-flow requirements for one- and two-family dwellings having a fire flow calculation area which does not exceed 3,600 square feet shall be 1,000 gallons per minute. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet shall not be less than that specified in Table B105.1."*

**Exception:** *A reduction in required fire-flow of 50%, as approved, is allowed when the building is provided with an approved automatic fire sprinkler system."*

**Special Note:** Based on the Section B105.1 (1,000 gpm) and the Exception (50%) the calculated fire-flow demand for a one- and two-family dwelling of less than 3,600 square feet would be 500 gallons per minute.

**Miscellaneous Modifications (Practical Difficulties) and Alternate Materials and Methods:**

(2007 CFC Appendix Chapter 1 - Administration)

- a) Section 104.8 Modifications. (Page 495)  
*"practical difficulties" can be the economics of a project.*
- b) Section 104.9 Alternative Materials and Methods. (Page 495)  
*"The fire code official is authorized to approve an alternate material or method of construction where the fire code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the materials, methods or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety."*

# LAWS & REGULATIONS SUB-GROUP

## INTRODUCTION

There are a variety of laws and regulations related to fire protection water supply. The primary goal of this sub-group was to identify those pertinent sections of law and applicable regulations to create a resource list, as well as identifying any changes needed.

The following “Key Issues” and recommendations were evaluated and researched by this sub-group:

### **1. Liability and legal issues**

- a. Public Meeting Criteria
  - Ralph M. Brown Act “Brown Act”
    - Government Code Section 54950-54963
  - Bagley-Keene Open Meeting Act “Bagley-Keene Act”
    - Government Code Sections 11125-11125.9
- b. Water Purveyor Shutting Off Water Supply for Non-Payment
  - General Order No. 103
    - CA Public Utility Commission – Water Branch, Section I-6.1 thru .f

### **2. Potential legislative/administrative law action**

- None anticipated resulting from Phase I

### **3. Applicable statutes and regulations**

#### Water purveyors

- California Safe Drinking Water Act
  - Health & Safety Code Sections 116270-116275
- California Waterworks Standards
  - Title-17 and Title-22, CCR, Chapter 16 (Pages 177-197)



- Backflow/Cross-Connection
  - Health & Safety Code Sections 116800-116820
- Backflow/Cross-Connection
  - Health & Safety Code Sections 13114.5 and 13114.7
- Fees and charges
  - Government Code Section 66013

Enforcing Agency (Building Inspection)

- 2007 California Plumbing Code
  - Chapter 6, Pages 109-128, Section 603.4.16
- Fees and charges
  - Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000
  - *Government Code Section 66014[a]-[c]*

**PHASE I RECOMMENDATIONS - HEALTH & SAFETY CODE**

This section (H&S Code Section 13114.7) needs to be completely revised/updated due to the outdated reference to AWWA Manual No. 14 (M-14) which is based on the 1966 edition (1<sup>st</sup> edition). It should be noted that AWWA M-14 has been updated twice (2<sup>nd</sup> edition, 1990 and 3<sup>rd</sup> edition, 2004). The Class I and Class II referenced was based on the AWWA Manual when there were six (6) Classes, while today, under the 2004 edition the application is based on the functional capabilities of the device, whether that is:

1. Air Gap (AG)
2. Reduced-Pressure Principle Backflow Prevention Assembly(RP)
3. Reduced-Pressure Principle Detector Backflow-Prevention Assembly (RP)
4. Double Check Valve Backflow-Prevention Assembly(DC)
5. Double Check Detector Backflow-Prevention Assembly (DCDA)
6. Pressure Vacuum-Breaker Assembly (PVB)
7. Spill-Resistant Vacuum Breaker (SVB), Atmospheric Vacuum Breaker (AVB)
8. Dual Check (DC)
9. Dual Check with Atmospheric Vent (DC-AV).

It should also be noted that this section (H&S Code, Section 13114.7) references NFPA-13, 1980 edition which is not the currently adopted edition, and does not reference NFPA-13R and NFPA-13D (which had not been published when this section was originally added to the CA Health and Safety Code in 1982.

### Enforcing Agency (Fire Service)

- 2007 California Building Code, Chapter 35 and 2007 California Fire Code, Chapter 45
  - 2007 NFPA-13D (Section 6.2)
- Fees and charges
  - Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000
  - *Government Code Section 66014[a]-[c]*

## PHASE I RECOMMENDATIONS – NFPA 13D

There are several issues referenced in the three (3) drawings (Figures) in Section 6.2 of NFPA 13-D, which cause confusion:

1. Figure A.6.2(a)
  - a. Shows that the domestic is metered while the automatic fire sprinkler system is not.
  - b. Shows a rubber-faced check valve on the automatic fire sprinkler supply.
  - c. Shows a city gate valve which is not normally associated with a residential supply.
2. Figure A.6.2(b)
  - a. Shows the two different services with no meter on the service for the automatic fire sprinkler system and a meter on the domestic system service.
  - b. Shows a rubber-faced check valve on the automatic fire sprinkler supply.
  - c. Shows city gate valves on both services, which is not normally associated with a residential supply.
3. Figure A.6.2(c)
  - a. Shows a rubber-faced check valve on the automatic fire sprinkler supply.
  - b. Shows a city gate valve which is not normally associated with a residential supply.
4. Other references to be added to Chapter 35 CBC and Chapter 45/47 CFC:
  - a. American Water Works Association (AWWA) Manual 14, Recommended Practices for Backflow Prevention and Cross-Connection Control, 3<sup>rd</sup> edition (2004)
    - Chapter 5, Typical Hazards – Residential, Single-Family Fire Sprinkler Systems (Page 77-78)

- b. American Water Works Association (AWWA) Manual 31, Distribution System Requirements for Fire Protection, 4<sup>th</sup> edition (2008)
  - o Chapter 5, Automatic Fire Sprinkler Systems (Pages 39-45)
- c. American Water Works Association (AWWA) Research Foundation – Impact of Wet-Pipe Fire Sprinkler Systems on Drinking Water Quality (1998)
  - o A Study of water quality to determine the need/benefit for Backflow/Cross-Connection on wet-pipe fire sprinkler systems.

Therefore:

1. Have the California State Fire Marshal (CSFM) propose amendments to the NFPA-13D Committee to address Items 1, 2, and 3 above and submit them on behalf of the State Fire Marshal's Office as being outdated and adding to the confusion of what is mandated and/or acceptable.
2. Have the CSFM develop "clean-up" language for the Health & Safety Code (Legislation) and CBC/CFC (California Building Standards Commission) to address the outdated reference in 4 above.

## **Conclusion**

This report represents the culmination of many hours of in-depth research and analysis from the SFM **Residential Fire Sprinkler/Water Supply Task Force**. Various disciplines related to water supply and how it relates to residential fire sprinklers developed the recommendations outlined in the previous sections of this report. The Task Force took into consideration the many different residential fire sprinkler water supply factors and tried throughout to address the complex and diverse issues that arose in preparation for a statewide residential fire sprinkler requirement for new construction scheduled for implementation January 1, 2011.

Additionally, as California moves forward to the implementation phase of the future residential fire sprinkler requirement it will be critically important to share the information gathered by this task force with all stakeholders throughout the state. It is recommended that key stakeholders continue to partner beyond this task force process and conduct training and outreach on the issues throughout California. See **Appendix D** for a **proposed** training and outreach plan.

## Appendix A

### Residential Fire Sprinkler/Water Supply Task Force Members List

<u>Member</u>	<u>Organization</u>	<u>Email</u>
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Whiting, Jennifer	League of California Cities	<a href="mailto:jwhiting@cacities.org">jwhiting@cacities.org</a>
*Alternates		-

## Appendix B

### Residential Fire Sprinkler/Water Supply Task Force Interested Parties

<u>Name</u>	<u>Organization</u>	<u>Email</u>
Evenson, Dale	Riverside County Fire	<a href="mailto:Dale.Evenson@fire.ca.gov">Dale.Evenson@fire.ca.gov</a>
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		-
		-

## Appendix C

### Residential Fire Sprinkler/Water Supply Task Force Subcommittees

	<u>Fees</u>		<u>Connection Configuration</u>
<b>Bruce</b>	<b>Lecair - Chair</b>	<b>Julie</b>	<b>Spacht - Chair</b>
Ray	Bizal*	Ray	Bizal*
Maria	Figueroa*	Jim	Bollier
Mark	Krause*		CALBO
Dave	Luker*	Heather	Collins*
Ian	Mac Donald	Maria	Figueroa*
Dennis	Mathisen	Richard	Hinrichs*
Ernie	Paez	Bill	Kirkpatrick
Julie	Spacht	Ed	Kriz
		Mark	Krause*
		Dave	Luker*
		Dennis	Mathisen
		Ernie	Paez
		Bob	Raymer
		Mike	Stewart
		Jennifer	Whiting

#### Laws & Regulations

	<b>Hart - Chair</b>
<b>Steve</b>	<b>Hart - Chair</b>
Heather	Collins*
Doug	Hensel
Richard	Hinrichs*
Ed	Kriz
Dennis	Mathisen
Ernie	Paez
Jennifer	Whiting

#### Process Efficiencies & Cost Impacts

	<b>Raymer - Chair</b>
<b>Bob</b>	<b>Raymer - Chair</b>
Ray	Bizal*
	CALBO
Darren	Drake
Doug	Dupree
Maria	Figueroa*
Steve	Hart
Doug	Hensel
Bruce	Lecair
Dennis	Mathisen
Ernie	Paez
Mike	Stewart
Jennifer	Whiting

\* Alternates

## Appendix D

### **“Draft Proposal” CSFM/CALBO/CFCA/HCD/CBIA Statewide Residential Fire Sprinkler Training/Outreach Partnership**

#### **Background:**

The concept of a formal “rollout” of the State Adoption of mandating that “All Newly Constructed One- and Two-Family Dwellings and Townhouses” with the 2010 California Residential Code (Title-24, Part 2.1) will provide an opportunity to educate the affected stakeholders (Building and Fire Officials, Water Purveyors, and Home Buildings/Fire protection Contractors with the necessary information to make the implementation on January 1, 2011.

It must be noted that through the Phase I Task Force meeting process, those individuals involved in the six (6) formal meetings (10/09/08, 11/20/08, 12/17/08, 01/21/09, 02/24/09, and 03/30/09) have gained a better understanding of the issues related to each other’s disciplines (water, fire, etc.) and as such, it would be helpful to also educate a significant number of the stakeholders who will be involved in the implementation of these building regulations.

#### **Timeline:**

- 06/30/09 - OSFM’s Residential Fire Sprinkler/Water Purveyor Task Force Training Proposal to Assistant State Fire Marshal
- 09/01/09 - State Fire Marshal and Assistant State Fire Marshal to convene Task Force Sub-Committee to develop outline for a series of one day Training Classes to be delivered statewide.  
*(Training to be focused on the implementation of a statewide Residential fire sprinkler requirement as outlined in the 2010 Edition of the CBC and/or CRC [yet to be defined] which would be effective on January 1, 2011.)*
- 01/01/10 - Formal Agreements for delivery of Training between the Partnership **(CSFM/CALBO/CFCA/HCD/CBIA)**
- 03/01/10 - Flyers for Classes Released/Distributed statewide
- 05/01/10 - First Training Class presented
- 01/01/11 - Effective Date of CBC and/or CRC [yet to be defined] which will require “all newly constructed one- and two-family dwellings and townhouses constructed in California to be equipped with a residential fire sprinkler system.
- 06/30/11 - Final Class presented.

## **Anticipated Locations of 1-day State Amendment Classes:**

- Eureka
- Fresno/Bakersfield
- Los Angeles/Glendale
- Modesto/Merced
- Monterey/Salinas
- Oakland/Concord
- Orange County Area
- Redding/Red Bluff
- Riverside/San Bernardino
- Sacramento
- San Diego
- San Jose
- San Luis Obispo
- Santa Rosa/Napa
- Ventura/Santa Barbara
- Others

### **Special Note:**

*There should be a minimum of two (2) locations (Sacramento, and Los Angeles) reserved for the purpose of beta testing the training course for the application, review, inspection and approval of a residential fire sprinkler as required under the requirements as outlined in the CBC and/or CRC [yet to be defined] and under the installation guidelines of the "Installation Standard (NFPA-13D)".*

### **Questions remaining to be answered/addressed:**

1. Class/Delivery sites (Hotels or Fire Department Training Centers, etc.)?
  - a. CalBO Institution/Education Week?
  - b. NorCal/SoCal FPO's Workshop (March 2010)
2. Instructors: (The concept of team teaching with representatives from the participating partnership - **CSFM/CALBO/CFCA/HCD/CBIA**)
3. Cost for attendees?
4. Cost (or free) for class handouts?
5. Host Agency/Sponsor receives complementary spaces/seats?
6. Actual Schedule of dates:
  - a. Tuesday, Wednesday, Thursday?
  - b. Tuesday, Thursday?
- c. NorCal verses SoCal (travel)?
7. Class Hours:
  - a. 08:30 to 12:00 and 13:00 to 16:30?
  - b. 08:00 to 12:00 and 12:45 to 17:00?
8. Travel/Hotel Costs for Instructors (if they participate in delivery)?
9. Handout Materials (costs, development)?
10. Other questions???????



**Target Audience for Training:**

1. Fire Department/Fire Prevention Personnel (Plan Review, and Inspections)
2. Building Department Personnel (Plan Review, and Inspections)
3. Water Purveyors (Plan Review, and Inspections)
4. Home Builders (BIA Chapters)/Contractors (Plan Preparation, Submittals, and Installation)
5. Contractors: General Building Contractors [B], Fire Protection Contractor [C-16])