BEFORE THE PUBLIC SERVICE COMMISSION
STATE OF MISSOURI

ORIGINAL

IN THE MATTER OF	)
MISSOURI-AMERICAN WATER	) Case No. WR-2010-0131
COMPANY'S REQUEST FOR	) Consolidated
AUTHORITY TO IMPLEMENT A	)
GENERAL RATE INCREASE FOR	)
WATER SERVICE PROVIDED IN	) March 10, 2010
MISSOURI SERVICE AREA	) Jefferson City, Missouri

DIRECT TESTIMONY OF
JASON WEBB
ON BEHALF OF
ST. LOUIS AREA FIRE SPRINKLER ASSOCIATION

a witness, produced, sworn and examined on the 10th day of March 2010, between the hours of 8:00 a.m. and 6:00 p.m. of that day, at the Law Offices of Terry C. Allen, 612 East Capitol, in the City of Jefferson, County of Cole, before

Tammy F. Ballew
Certified Court Reporter No. 563
CAPITAL CITY COURT REPORTING
Jefferson City * The Lake * Columbia
573-761-4350 * 573-365-5226 * 573-445-4142

within and for the State of Missouri, in the above-entitled cause, on the part of the St. Louis Area Fire Sprinkler Association, taken pursuant to notice.

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A P P E A R A N C E S

FOR THE ST. LOUIS FIRE SPRINKLER ASSOCIATION:

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SIGNATURE INSTRUCTIONS:

Signature Waived.

EXHIBIT INSTRUCTIONS:

FSA Deposition Exhibits 3 through 7, inclusive, are attached to the transcript.

I N D E X

E X H I B I T S

JASON WEBB, having first been duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. ALLEN:

Q. State your name for the record.

A. Jason Webb.

Q. And where do you live, Mr. Webb?

A. I live in Urich, U-r-i-c-h, Missouri.

Q. Okay. Where's that?

A. It is 60 miles southeast of Kansas City.

Q. And so you are on the western side of the state?

A. I am.

Q. Okay. And what is your occupation or profession?

A. I am the fire marshal for the City of Belton Fire Department.

Q. Okay. And do you understand today that I have asked you, on behalf of the St. Louis Area Fire Sprinkler Association, to provide direct testimony in the matter of Missouri-American Water Company's request for authority to implement a direct rate increase for water service provided in the Missouri service area, namely, Case WR-2010-0131, consolidated with other cases?

A. I do.

Q. Okay. And my name is Terry Allen. I'm an attorney who represents the St. Louis Area Fire Sprinkler Association. And as we go through this, your testimony will be marked as an exhibit and made part of the direct prefile testimony on behalf of the Association. In this case we mark the exhibits as FSA for Fire Sprinkler Association. Is that okay with you?

A. It is.

(FSA DEPOSITION EXHIBIT NO. 4 WAS MARKED FOR IDENTIFICATION BY THE COURT REPORTER.)

BY MR. ALLEN:

Q. Okay. Now, Mr. Webb, I'm going to hand you what we have marked as FSA Exhibit 4, and it consists of two pages. And would you tell me what that is (indicating)?

A. This is my curriculum vitae (indicating).

Q. Okay. And you prepared that and supplied that to me, did you not?

A. I did.

Q. Okay. You didn't prepare it necessarily for this direct testimony, you've had it prepared -- you probably keep it in the ordinary course of business, don't you?

A. I updated it for this testimony, but, yes, I maintain a CV.

Q. Okay. Do you hold any elected positions?

A. I currently hold the position as President of the Fire Marshals' Association of Missouri.

Q. And how long have you held that position?

A. I was elected to the Fire Marshals' Association of Missouri as President in 2005.

Q. Okay. And do you still serve in that position?

A. I do.

Q. Okay. And I noticed on your resume, it indicates that the Fire Marshals' Association of Missouri represents approximately 200 fire protection professionals throughout the State of Missouri.

A. That's correct.

Q. Now, with reference to the filings in this case for authority to implement a general rate increase by Missouri-American Water, had you seen some of the tariffs, or drafts of tariffs, that Missouri-American Water has purportedly filed in this case?

A. I have. I reviewed them off of the Public Service Commission's website.

Q. Okay. What is NFPA?

A. NFPA stands for the National Fire Protection Association.

Q. Okay. And what is 13D of NFPA?

A. NFPA Standard 13D is the standard for the installation of residential sprinkler systems in a limited number of dwellings. But it's a dwelling unit system. That's what the D stands for.

(FSA DEPOSITION EXHIBIT NO. 5 WAS MARKED FOR IDENTIFICATION BY THE COURT REPORTER.)

BY MR. ALLEN:

Q. Okay. And you provided me with Exhibit 5, FSA Exhibit 5, did you not?

A. I did.

Q. Can you identify for us what that exhibit is?

A. The exhibit contains three pages from the appendix or Annex A of 13D of the National Fire Protection Association.

Q. Okay. And why is that significant?

A. There's a couple of interesting quotes in that annex.

Q. Okay. What are they, please?

A. The quote that I find the most telling is dealing with separate water taps and if you -- I'll just quote. It discusses the need or the request by many water companies to maintain separate taps for residential sprinkler systems, separate from the domestic water supply. And then the quote that they say in NFPA 13D's Annex says, "Millions of people

should not have to pay hundreds of millions of dollars to install separate water taps and lines for a few services that might get shut off," unquote.

That is a reference -- referencing typical statements by water companies that they expressed concern with -- if they shut off a domestic water supply to a home, that it would also in turn shut off the fire protection system and that they would somehow be liable.

Q. Okay. And is that a real concern?

A. It's not a concern -- the document also references -- I'll read from the document. It says, if they do shut off the water, they are creating violations of all sorts of health and safety codes. Concern over fire protection for those individuals when they are violating all kinds of other health codes is disingenuous.

Q. Okay. So what is your view or opinion with regard to the taps that are needed for private sprinkler systems with regard to 13D and what you are reading from Exhibit 5, I think it is?

A. While 13D allows different configurations, their preferred connection is a single tap, single service system. And what they are saying in this annex is something that I believe strongly in, that, you

know, it's all about risk analysis or risk avoidance. You know, it's -- the chances of someone being seriously injured or killed in a home fire are significantly higher -- or significantly reduced with a home sprinkler system. So the chances that something might happen because they ended up having to shut the water off because of nonpayment or so -- you know, the risks just go further and further down.

Q. Okay. So what is your concern about any proposal of MO American Water, as you understand it, with regard to taps for fire -- private fire sprinkler systems in family residences?

A. The tariffs -- the proposals -- the proposed rules, as I understand them, allow, at the company's sole discretion, the requirement for a separate tap. When they do require a separate tap, they -- it's explicit in their documentation that they are going to require separate fees for those taps -- or for those fees.

In other words, a separate meter and then a monthly charge or annual charge for that separate meter. That produces or results in an undue burden, in my opinion, on the homeowner that's just simply trying to protect their home and their family. This throws up additional roadblocks, additional expense that we would

like to try to avoid.

Q. Could you discuss for the Public Service Commission the differences between water usage -- a private sprinkler system versus water usage of just someone who has a fire that doesn't have a fire -- a private sprinkler system?

A. Commonsense tells you that a building that's sprinklered that experiences a fire, typically, the fire is extinguished by one or two heads with a flow of a few gallons a minute for a period of time, is going to be significantly less than the potentially thousands or tens of thousands or more gallons of water we are going to apply to a similar fire in a home without a sprinkler system because of that. The fire is going to grow obviously larger, unchecked, prior to our arrival -- those kind of things -- our being the Fire Department's arrival.

Q. Who's penalized as a result of having a sprinkler system and having -- I assume you are referring to standby fees when you were talking about the fees earlier; is that what you were referring to?

A. Correct. Using an example of a street -- let's just use an example of four homes on a street. Three of the homes do not have a sprinkler system and one home does. The home that does has to pay an

additional fee, or a standby fee -- whatever the term is. That person is at less -- produces less of a risk to the water system because the studies that we refer to and the facts as we know them, we know the fire that they are going to experience is going to use less water than the fire that occurs in the other three homes, but yet, they are not taxed or not charged an additional fee for the risk that they are putting on the water system.

Q. So Missouri-American Water is permitted to charge a standby fee for private sprinkler systems. Does that discourage, in your judgment, families from basically installing those systems in their home?

A. It does. If a family has to make a decision with limited resources like everybody has, you know, and they're building a home, they're enlarging their home, whatever the case is, and while they're weighing all their different options that they can put in their home, obviously, one of them is a residential sprinkler system. Knowing that they can install that system for a set dollar amount and it's going to provide protection for them and their families from then on is a great relief to many people. Having a standby fee or an additional charge on their monthly bill coming from their water company obviously is going to make a

difference in their decision-making process.

(FSA DEPOSITION EXHIBIT NO. 6 WAS MARKED FOR IDENTIFICATION BY THE COURT REPORTER.)

BY MR. ALLEN:

Q. And you've provided me with -- and I'll ask you to identify, FSA 6, what is that (indicating)?

A. It's a summary of a report that's called the Scottsdale Report. It's a summary produced or printed off the Home Fire Sprinkler Coalition's website.

Q. Okay. And what is the significance of this document in terms of what it reports?

A. Scottsdale, Arizona enacted a residential sprinkler ordinance on January 1, 1986. After 15 years of that being in place, they -- the City -- the fire folks went back and studied their data, their fire loss data on the homes that were sprinklered versus homes that weren't. Those numbers are included in this report and they -- they're pretty telling.

According to the Scottsdale -- I'm quoting from this, the page that I handed you. It says, According to the Scottsdale Report, there was less water damage in the homes with sprinklers. Sprinkler systems discharge an average of 341 gallons of water per fire while 2,935 gallons of water per fire were released by firefighter hoses in homes that weren't

sprinklered.

Q. So does this give you pause to think that homes with sprinkler systems are more water conservation conscious, if you will?

A. I think without a doubt. This shows us that, you know, the numbers are clear in their report and other studies that have been less in detail, but have come up with similar results, show that, again, this one, this particular study, shows 341 gallons per fire versus almost 3,000 gallons per fire.

Q. Then, again, if that is -- the study itself, the Scottsdale, it's considered to be an authoritative source for this type of information as to water usage with private sprinkler systems over a period of time versus nonprivate over a period of time in Scottsdale, right?

A. Correct.

Q. Okay. And this is kind of a standard report that fire marshals and fire service people look at all the time to determine the propriety of such sprinkler systems?

A. Correct. Scottsdale was one of the first to enact their sprinkler legislation. They were kind of looked at as a leader in that area, and then when -- so when the study came out, it produced some very telling

results that we rely upon.

It is the quantitative study that's out there -- that is out there currently. There's been additional studies. For instance one -- Prince George's County in Maryland did a similar study, but came up with similar numbers. Other studies have just duplicated the information that we found out in the Scottsdale report.

Q. So in the interest of the public and public safety and being cost-conscious and water-usage conscious, is it your view that the -- any tariffs that are considered by the Missouri Public Service Commission in this case should not contain standby charges for private sprinkler systems in residences?

A. Yes. We feel it discourages sprinklers and, therefore, results in the things we've talked about.

(FSA DEPOSITION EXHIBIT NO. 7 WAS MARKED FOR IDENTIFICATION BY THE COURT REPORTER.)

BY MR. ALLEN:

Q. Do you have any concern about -- well, let me ask you this. Let me hand you FSA Exhibit 7. You provided that to me. What is that (indicating)?

A. It's just an excerpt from a document entitled, Fire Loss in the United States 2008. That's a document that's produced -- the document itself is

produced annually by the National Fire Protection Association. It's kind of a summary of fire experiences in the United States during the previous year.

Q. Is there any particular other -- any significance to it for the purpose of your opinion relative to standby fees?

A. Yeah. This document reads that while -- with home fire deaths still accounting for 2,755 fire deaths or 83 percent of all civilian fire deaths, fire safety initiatives targeted at the home remain the key to any reductions in the overall fire death toll. And then further on it discusses several strategies to reduce deaths. And the third in their list of strategies is, quote, "The wider use of residential sprinklers must be aggressively pursued," unquote.

Q. And I take it it's your opinion we shouldn't do anything that discourages that?

A. Yes.

Q. Okay. Now, you had talked to me prior to giving your testimony about kind of the design of the sprinkler system and the connection.

A. Uh-huh.

Q. Who should determine the size of the connections in these residences?

A. Currently, under state law, the sprinkler system has to be designed by a registered design professional in the State of Missouri. There are some proposed rule changes in the state to lower that slightly by allowing a NICET Level III or above. It's just a national certification allowed for sprinkler designers. The rule changes would allow folks that are certified in sprinkler design, in other words, to design sprinkler systems.

The rules that Missouri-American Water has proposed indicate that the company will decide what size of a tap will be required. In our opinion -- or in my opinion, the design professional familiar with sprinkler systems should decide that size, not the water company.

Q. And is it your opinion that the design and the size of the connection should at least be consistent with 13D NFPA?

A. Correct. 13D, again, as the nationally recognized standard for the design of sprinkler systems, should be, and in most cases it will be mandated -- the system will be mandated to meet those design requirements. The rule changes I spoke of -- they're working their way through the promulgation phase right now -- require that the system -- a system

designed in accordance with NFPA 13D can be designed by this NICET technician versus a professional engineer, because NFPA 13D is kind of what we refer to as a cookbook design. It spells out the entire design for the designer. It doesn't -- it doesn't require -- NFPA 13D doesn't require any engineering judgment. It's more, like I said, a cookbook -- kind of a guide book.

Q. And you refer to this being worked on now. Who's working on it now?

A. The changes are -- were requested through professional licensing -- the professional licensing board -- the board in Missouri that regulates design professionals and their licensing.

Q. And is it your opinion that the design or the connection should not be left to the discretion of Missouri-American Water?

A. It is. We would -- authorities having jurisdiction such as myself, a fire marshal in a jurisdiction, we rely upon trained designers, people familiar with the intricacies of a sprinkler system, to design the systems. They know what the demands are of the system and so on. They calculate those out and, therefore, they decide the size of the tap that's required.

Q. What about metering, is it necessary to have a meter, you know, with reference to the fire sprinkler system -- a separate meter, if you will, for that system in a one-, two-family dwelling?

A. It seems, again, to us as an undue burden -- an additional burden on the homeowner to have that separate meter. When -- any water used to fight a fire -- for example, in an unsprinklered home, we don't typically bill that homeowner for the water used for that fire. So, you know, in the fire service's opinion, it doesn't seem to make a lot of sense to bill for the much smaller amount of water used in a sprinklered home.

Q. As opposed to --

A. As opposed to the much larger amount of water that we would use fighting the fire in an unsprinklered home.

Q. And then fighting the fire in an unsprinklered home, that doesn't come from a metered tap anyway?

A. Correct. It would come from a fire hydrant, a fire plug --

Q. Who pays for that water?

A. Who specifically pays for it, I don't know. It would -- typically fire departments don't bill for

that water. You know, we don't track the amount of water used on a routine structure fire. But, obviously -- but we know the amounts are significantly larger. What these tariffs do, is they want to make sure that we're charging for that little bit of water that's used in a sprinklered fire.

Q. And that -- does that in your opinion seem discriminatory?

A. It seems like, again, it places just another burden, another hurdle on someone trying to decide whether they want to sprinkle their home or not.

Q. Is there anything else that you have today that you could share with the Judge and the Public Service Commission that concerns you about the current filing of Missouri-American Water for authority to file tariffs reflecting increased rates for its water and sewer services?

A. There are a couple of things, and I kind of understand -- again, coming from a -- being an authority having jurisdication, working in a municipality, I understand the need to have rules and regulations and, you know, that's what my business is all about. But one of the items in their documentation says, no regulations or ordinances of local governments shall be permitted to impose differing construction

methods.

Well, again, if you're -- if you own, or you're a jurisdiction, a local jurisdiction, and it would seem to me you know what your risks are, or your hazards are in your community a little bit better than a large company would, I have a concern with the fact that no local governments, according to this, could have any rules or regulations on material selection, water main sizes, fire line sizes, fire service line configurations and those kinds of things.

Q. Okay. Are those also addressed in the things like any standards from the NFPA?

A. They are. Again, 13D is -- is a complete design manual from water supply through the sprinkler head itself, so it encompasses the entire design, the tap size, all that.

Q. So in your judgment would it be well that the American Water Company, you know, be required to at least implement those standards as they are applicable to their systems?

A. Yes. With NFPA 13D being, again, the nationally recognized standard for the installation of residential sprinkler systems, it would certainly make it less burdensome on a code official -- I can tell you that -- you know, to have their regulations consistent

with the nationally recognized standard versus different.

Q. And that's for the benefit of public safety, costs and everything, isn't it?

A. Costs, it speeds review time, allows development to take place sooner as it works its way through the review process, those kinds of things. Absolutely.

Q. Can you think of anything else today?

A. Nothing comes to mind. I think we've pretty much hit everything.

Q. Okay. Then I would ask you to be reminded that this is your direct testimony in the case that I referenced earlier; is that correct?

A. Correct.

Q. And as such, it's -- the information that you shared your opinions and views are true and correct to the best of your knowledge and belief?

A. They are.

Q. And based on your education, experience and the whole ball of wax that you've had for, what, 22 years of professional fire service, right?

A. That's correct.

MR. ALLEN: Okay. I'm not going to ask you to sign this. We are going to submit it as your

testimony under oath, with these exhibits. Is that okay?

THE WITNESS: That's okay.

MR. ALLEN: Okay. Thank you. Appreciate it.

(SIGNATURE WAIVED.)

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C E R T I F I C A T E

STATE OF MISSOURI)
) ss
COUNTY OF HOWARD)

I, Tammy F. Ballew, Certified Court Reporter of the firm of Capital City Court Reporting, 210 East High Street, Suite 110, Jefferson City, Missouri 65101 do hereby certify that pursuant to notice there came before me,

JASON WEBB,

at the Law Offices of Terry C. Allen, 612 East Capitol, in the City of Jefferson, County of Cole, who was first sworn by me to testify the whole truth of his knowledge concerning the matter in controversy aforesaid; that he was examined, and his examination then and there was recorded by stenomask verbatim recording and afterwards transcribed and is fully and correctly set forth in the foregoing pages; and the witness and counsel waived presentment of this deposition to the witness, by me, and that the reading and signing of this deposition was waived, and is herewith returned.

I further certify that I am neither attorney or counsel for, nor related to, nor employed by any of the parties to this action in which this deposition is taken; and further that I am not a relative or employee of any attorney or counsel employed by the parties hereto, or financially interested in this action.

IN WITNESS WHEREOF, I have hereunto set my hand this 19th day of March, 2010.

Tammy F. Ballew, CCR
CAPITAL CITY COURT REPORTING

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Curriculum Vitae

Jason E. Webb
Urich, MO
jason@gett-webbfire.com

Area of Specialization

Fire Prevention and Fire Risk Management

Background and Professional Experience

Over 22 years of professional fire service
Currently serve as Asst. Chief/Fire Marshal for suburban Kansas City, MO fire department
Involved in construction industry for over 25 years
Participated in extinguishment and/or investigation of nearly 1000 fires of all types

Prior to appointment as Fire Marshal, spent over a decade as a firefighter and paramedic assigned to an engine company. Current duties involve planning, directing and coordinating fire prevention and fire risk management throughout the City and surrounding area. Co-founded City's multi-discipline Development Review Committee which has overseen more than one million square feet of new residential and commercial construction in recent years.

Oversee the on-going inspection of approximately 700 commercial occupancies.

Wide ranging construction experience from carpenter, through owning and operating a construction firm to serving and fire code official.

Principal partner of a fire prevention/fire risk management based training and consulting firm
Received competitive grant funding for course delivery for the past three years

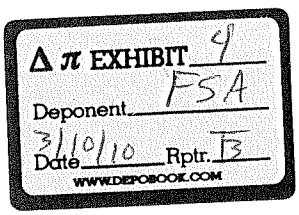
Providers of fire protection education and consulting to government and private firms. Presented custom risk-based training for Missouri Division of Fire Safety, Missouri Association of Code Enforcement, Fire Marshals Association of Missouri, University of Missouri Fire and Rescue Training Institute and numerous public and private clients. Provided direct instruction to more than 1400 people.

Education and Training

Over 800 hours of formal and technical education

Fully trained in all facets of municipal firefighting, fire department management, and local government operation. Specific areas of study include professional leadership, fire investigation and fraud detection, incident management, fire code administration and enforcement, fire sprinkler design and review, fire protection engineering, and many others. Currently certified as:

- *Fire Inspector (State of Missouri)*



- *Fire Inspector (International Code Council)*
- *Fire Investigator (State of Missouri – Internationally Accredited)*
- *Fire Service Instructor (State of Missouri – Internationally Accredited)*
- *Fire Fighter (State of Missouri)*
- *Fire Plans Examiner (International Code Council)*

Professional Affiliations and Activities

Fire Marshals Association of Missouri (numerous positions, currently in 3rd term as President)
International Code Council (active member and chapter president)
Firefighters Association of Missouri (active member since 1987)
Heart of America Fire Chiefs Association (fire prevention committee)
Missouri Association of Building and Fire Officials (board member)
National Fire Sprinkler Association (fire service member)

Additional Committees/Activities
Community Visioning Team coordinating committee (2004-2006)
School District Strategic Planning Committee (2005-2006)
Numerous Code Adoptions (coordinated with other city departments)
2007, 2008, 2009 International Code Council Annual Conferences
Participated in 2009 & 2012 ICC code development cycles
Attended/coordinated FMAM conferences 2002-current
County Landlords Association (fire service representative)
Park Board Alternative Funding Committee
Served on 2 regional revitalization committees
Missouri Fire Service Alliance (lobby group)
Midwest Code Action Committee (ICC code development committee)
Courtroom testimony for fire cause/origin, fire code issues, and records maintenance
Testified before MO House Appropriations Committee regarding fire training funds
2007 Nominee for FFAM Chief of the Year

Elected to position of President of the Fire Marshals Association of Missouri in 2005 (still serving in that role). FMAM represents approximately 200 fire protection professionals throughout the State of Missouri.

Authored Missouri's Residential Sprinkler "Mandatory Option": A Guide for Missouri Communities, copyright 2010, Gett-Webb Fire

Table A.5.2.1(a) SDR 13.5 IPS Pipe (CPVC)

Nominal Pipe Size (in.)	Average Outside Diameter (in.)	Average Inside Diameter (in.)
¾	1.05	0.87
1	1.32	1.10
1¼	1.66	1.39
1½	1.90	1.60
2	2.38	2.00
2½	2.88	2.42
3	3.50	2.95

Table A.5.2.1(b) SDR 9 CTS Pipe (PEX)

Nominal Diameter (in.)	Outside Diameter		Wall		Inside Diameter	
	in.*	mm	in.†	mm	in.	mm
⅜	0.50	12.7	0.07	1.8	0.36	9.1
½	0.63	15.9	0.07	1.8	0.49	12.3
¾	0.88	22.2	0.10	2.5	0.68	17.2
1	1.30	28.6	0.13	3.2	0.88	22.2
1¼	1.38	34.9	0.15	3.9	1.07	27.2
1½	1.63	41.2	0.18	4.6	1.26	32.1
2	2.13	54.0	0.24	6.0	1.65	42.0

* Average dimensions from ASTM F 876.
† Minimum wall thickness from ASTM F 876.

solder, mastic, PVC coated floor clamps, pipe tapes, grease and cooking oils, rubber and plasticizers, antimicrobial coatings, and so forth. The chemical compatibility of such products with the particular pipe or fitting material must be verified prior to use. Otherwise, contact between the construction product and the pipe or fitting must be avoided.

A.5.2.4 Compatible thread sealant or Teflon tape can be used in a CPVC sprinkler head adapter. The combination of the two cannot be used together. The manufacturer of the sprinkler head adapter installation instructions must be followed for each sprinkler head adapter used.

A.5.2.9.2 Not all fittings made to ASTM F 437, *Standard Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*; ASTM F 438, *Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40*; and ASTM F 439, *Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*, as described in 5.2.9.2 are listed for fire sprinkler service. Listed fittings are identified by the logo of the listing agency.

A.5.3 It is not the intent of NFPA 13D to require the use of NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, for any supply piping.

A.6.2 The connection to city mains for fire protection is often subject to local regulation of metering and backflow prevention requirements. Preferred and acceptable water supply arrangements are shown in Figure A.6.2(a), Figure A.6.2(b), and Figure A.6.2(c). Where it is necessary to use a meter between the city water main and the sprinkler system supply, an acceptable arrangement as shown in Figure A.6.2(c) can be used. Under these circumstances, the flow characteristics of the meter are to be included in the hydraulic calculation of the system [*see Table 8.4.4(g)*]. Where a tank is used for both domestic and fire protection purposes, a low water alarm that actuates when the water level falls below 110 percent of the minimum quantity specified in 6.1.2 should be provided.

The effect of pressure-reducing valves on the system should be considered in the hydraulic calculation procedures.

Table A.5.2.1(c) Steel Pipe Dimensions

Nominal Pipe Size		Outside Diameter		Schedule 5 Inside Diameter		Schedule 5 Wall Thickness		Schedule 10[a] Inside Diameter		Schedule 10[a] Wall Thickness		Schedule 30 Inside Diameter		Schedule 30 Wall Thickness		Schedule 40 Inside Diameter		Schedule 40 Wall Thickness	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
½[b]	15	0.84	21.3	—	—	—	—	0.67	17.0	0.08	2.1	—	—	—	—	0.62	15.8	0.11	2.8
¾[b]	20	1.05	26.7	—	—	—	—	0.88	22.4	0.08	2.1	—	—	—	—	0.82	21.0	0.11	2.9
1	25	1.32	33.4	1.19	30.1	0.07	1.7	1.10	27.9	0.11	2.8	—	—	—	—	1.05	26.6	0.13	3.4
1¼	32	1.66	42.2	1.53	38.9	0.07	1.7	1.44	36.6	0.11	2.8	—	—	—	—	1.38	35.1	0.14	3.6
1½	40	1.90	48.3	1.77	45.0	0.07	1.7	1.68	42.7	0.11	2.8	—	—	—	—	1.61	40.9	0.15	3.7
2	50	2.38	60.3	2.25	57.0	0.07	1.7	2.16	54.8	0.11	2.8	—	—	—	—	2.07	52.5	0.15	3.9
2½	65	2.88	73.0	2.71	68.8	0.08	2.1	2.64	66.9	0.12	3.0	—	—	—	—	2.47	62.7	0.20	5.2
3	80	3.50	88.9	3.33	84.7	0.08	2.1	3.26	82.8	0.12	3.0	—	—	—	—	3.07	77.9	0.22	5.5

[a] Schedule 10 defined to 5 in. (127 mm) nominal pipe size by ASTM A 135, *Standard Specifications for Electric-Resistance-Welded Steel Pipe.*
[b] These values applicable when used in conjunction with 8.15.19.3 and 8.15.19.4 of NFPA 13.
[**13:** Table A.6.3.2]

Table A.5.2.1(d) Copper Tube Dimensions

Nominal Tube Size		Outside Diameter		Type K				Type L				Type M			
				Inside Diameter		Wall Thickness		Inside Diameter		Wall Thickness		Inside Diameter		Wall Thickness	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
¾	20	0.88	22.2	0.75	18.9	0.07	1.7	0.79	19.9	0.05	1.1	0.81	20.6	0.03	0.8
1	25	1.13	28.6	1.00	25.3	0.07	1.7	1.03	26.0	0.05	1.3	1.06	26.8	0.04	0.9
1¼	32	1.38	34.9	1.25	31.6	0.07	1.7	1.27	32.1	0.06	1.4	1.29	32.8	0.04	1.1
1½	40	1.63	41.3	1.48	37.6	0.07	1.8	1.51	38.2	0.06	1.5	1.53	38.8	0.05	1.2
2	50	2.13	54.0	1.96	49.8	0.08	2.1	1.99	50.4	0.07	1.8	2.01	51.0	0.06	1.5
2½	65	2.63	66.7	2.44	61.8	0.10	2.4	2.47	62.6	0.08	2.0	2.50	63.4	0.07	1.7
3	80	3.13	79.4	2.91	73.8	0.11	2.8	2.95	74.8	0.09	2.3	2.98	75.7	0.07	1.8

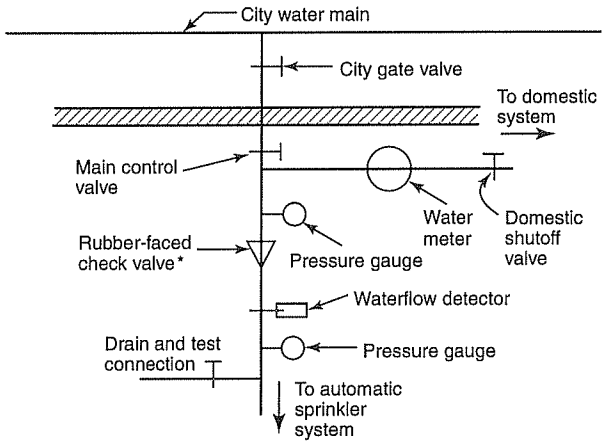
[13: Table: A.6.3.5]

Figure A.6.2(a) is the preferred method for getting the water supply into the unit for a stand-alone sprinkler system (one that does not also provide direct connections to the cold water fixtures) because the common supply pipe for the domestic system and the sprinkler system between the water supply and the dwelling unit has a single control valve that shuts the sprinkler system, which helps to ensure that people who have running water to their domestic fixtures also have fire protection. This serves as a form of supervision for the control valve and can be used to make sure that the valve stays open in place of other, more expensive options such as tamper switches with a monitoring service.

Some water utilities insist on separate taps and supply pipes from the water supply to the dwelling unit for fire sprinkler systems as shown in Figure A.6.2(b), due to concerns about shutting off the water supply for nonpayment of bills and the desire not to shut off fire protection if this ever occurs. While this type of arrangement is acceptable, it is not cost efficient and should be discouraged due to the extra cost burden this places on the building owner. The concern over shutting off the water for nonpayment of bills is a nonissue for a number of reasons. First, the water utilities rarely actually shut off water for nonpayment. Second, if they do shut off water for nonpayment, they are creating violations of all sorts of health and safety codes, allowing people to live in a home without running water. Concern over the fire protection for those individuals when they are violating all kinds of other health codes is disingenuous. More likely, the water utility will not shut off the water and will follow other legal avenues to collect on unpaid bills such as liens on property. Millions of people should not have to pay hundreds of millions of dollars to install separate water taps and lines for the few services that might get shut off.

A.6.2.1 The flow of water is necessary to make sure that the pump does not get damaged during testing. Use of a timer to keep the pump running is not recommended because the timer will allow the pump to run when no water is flowing. The pump needs to run for the entire duration without interruption, including not tripping the circuit breaker.

A.6.2.3 The best method for getting the water supply into the unit for a stand-alone sprinkler system (one that does not also provide direct connections to the cold water fixtures) is to have a common pipe for the domestic system and the sprinkler system between the water supply and the dwelling unit.



* Rubber face optional.

FIGURE A.6.2(a) Preferable Arrangement for Stand-Alone Piping Systems.

Once inside the dwelling unit, the pipes can be split to provide the individual domestic and sprinkler systems. In this arrangement, a single control valve on the combined pipe (prior to the split) as shown in Figure A.6.2(a) being the only control valve that shuts the sprinkler system is preferred because it ensures that people who have running water to their domestic fixtures also have fire protection. This serves as a form of supervision for the control valve and can be used to make sure that the valve stays open in place of other, more expensive options such as tamper switches with monitoring service.

Some water utilities insist on separate taps and supply pipes from the water supply to the dwelling unit for fire sprinkler systems due to concerns about shutting off the water supply for nonpayment of bills and the desire not to shut off fire protection if this ever occurs. While this type of arrangement is acceptable [see Figure A.6.2(b)], it is not cost efficient and should be discouraged due to the extra burden this places on the building owner. The concern over shutting off the water for nonpayment of bills is a nonissue for a number of reasons. First the water utilities rarely actually shut off water for nonpayment. Second, if they do shut off water for nonpayment, they are creating violations of all sorts of health and safety

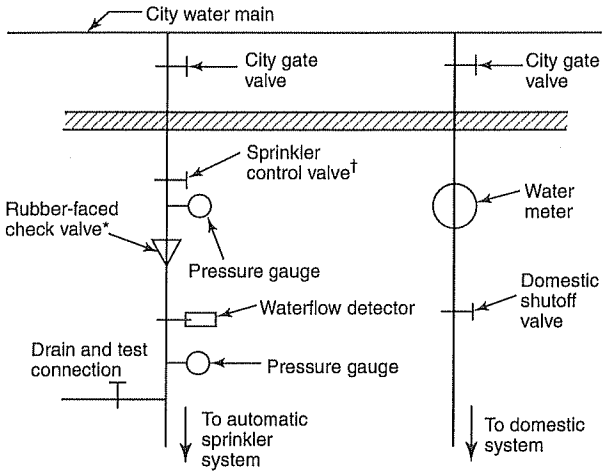


FIGURE A.6.2(b) Acceptable Arrangement for Stand-Alone Piping Systems with Valve Supervision — Option 1.

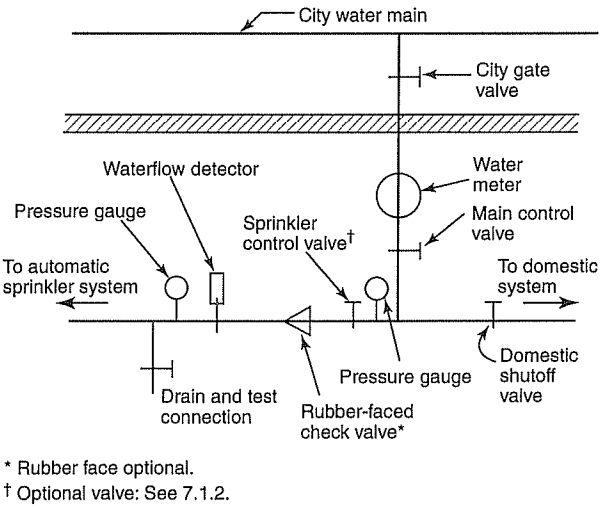


FIGURE A.6.2(c) Acceptable Arrangement for Stand-Alone Piping Systems with Valve Supervision — Option 2.

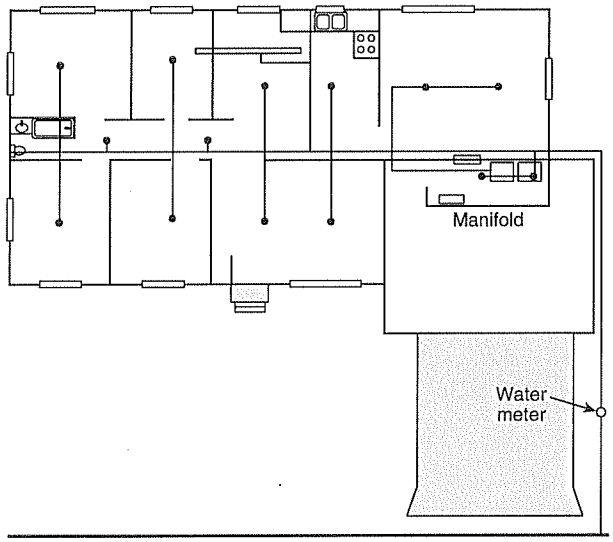


FIGURE A.6.3(a) Multipurpose Piping System — Example 1.

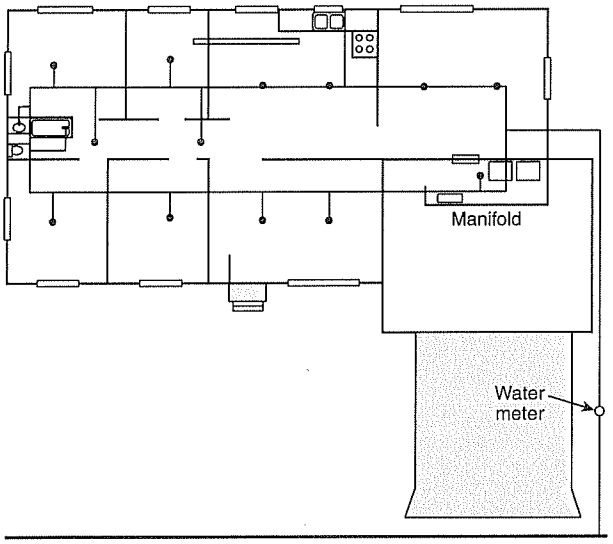


FIGURE A.6.3(b) Multipurpose Piping System — Example 2.

codes, allowing people to live in a home without running water. Concern over the fire protection for those individuals when they are violating all kinds of other health codes is disingenuous. More likely, the water utility will not shut off the water and will follow other legal avenues to collect on unpaid bills such as liens on property. Millions of people should not have to pay hundreds of millions of dollars to install separate water taps and lines for the few services that might get shut off.

A.6.3 Multipurpose piping systems consist of a single piping system within a residential occupancy that is intended to serve both domestic and fire protection needs. Basic forms of this system are shown in Figure A.6.3(a), Figure A.6.3(b), Figure A.6.3(c), and Figure A.6.3(d). A network system, as defined in 3.3.9.4, is a type of multipurpose system that utilizes a common piping system supplying domestic fixtures and fire sprinklers where each sprinkler is supplied by a minimum of three separate paths. In dwellings where long-term use of lawn sprinklers is common, provision should be made for such usage.

A.7.2.4 These connections should be installed so that the valve can be opened fully and for a sufficient time period to ensure a proper test without causing water damage. The test connection should be designed and sized to verify the sufficiency of the water supply and alarm mechanisms.

A.7.4.4 The reaction forces caused by the flow of water through the sprinkler could result in displacement of the sprinkler, thereby adversely affecting sprinkler discharge.

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Scottsdale Report 15 Year Data Now Available

In Scottsdale, Arizona, a sprinkler ordinance was implemented on January 1, 1986. Ten years after the ordinance was passed, the Rural/Metro Fire Department published the Scottsdale Report. The study has now been updated to include 5 additional years of data.

41,408 homes, more than 50 percent of the homes in Scottsdale, are protected with fire sprinkler systems.

Download a PowerPoint presentation with highlights of the 15 year data.

Lives Saved
in the 15 years there were 598 home fires. Of the 598 homefires, 49 were in single-family homes with fire sprinkler systems:
- There were no deaths in sprinklered homes.
- 13 people died in homes without sprinklers.
- The lives of 13 people who would have likely died without sprinklers, were saved

Download a PowerPoint presentation with details about fire fatalities and lives saved.

Less Fire Damage
There was less damage in the homes with sprinklers*:
- Average fire loss per sprinklered incident: $2,166.
- Average fire loss per unsprinklered incident: $45,019.
- Annual fire losses in Scottsdale (2000-2001) were $3,021,225 compared to the national average of $9,144,442.

Download a PowerPoint chart with details about fire losses.

Reduced Water Damage
Only the sprinkler closest to the fire will activate, spraying water directly on the fire. 90% of fires are contained by the operation of just one sprinkler.

According to the Scottsdale Report, there was less water damage in the homes with sprinklers:
- Sprinkler systems discharged an average of 341 gallons of water/fire.
- 2,935 gallons of water/fire were released by firefighter hoses.

Cost
Recent technology breakthroughs make sprinklers more affordable and easier to install in homes. On a national average, they add only 1% to 1.5% of the total building cost.
- In Scottsdale, the average cost is less than $.80 per square foot.

*Based on fires 1998-2001. 15-year data did not separate residential fire damage from all structures with fires.

15 years – 598 home fires
598 x 341 gal = 203,918 gallons (sprinklered) 12% of 2
598 x 2935 gal = 1,755,130 gallons (unsprinklered)

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FIRE LOSS IN THE UNITED STATES 2008

Michael J. Karter, Jr.

August 2009

(Revised September 2009)

National Fire Protection Association
Fire Analysis and Research Division

With home fire deaths still accounting for 2,755 fire deaths or 83% of all civilian deaths, fire safety initiatives targeted at the home remain the key to any reductions in the overall fire death toll. Five major strategies are: First, more widespread public fire safety education is needed on how to prevent fires and how to avoid serious injury or death if fire occurs. Information on the common causes of fatal home fires should continue to be used in the design of fire safety education messages. Second, more people must use and maintain smoke detectors and develop and practice escape plans. Third, wider use of residential sprinklers must be aggressively pursued. Fourth, additional ways must be sought to make home products more fire safe. The regulations requiring more childresistant lighters are a good example, as are requirements for cigarettes, with reduced ignition strength (generally called "fire-safe" cigarettes). The wider use of upholstered furniture and mattresses that are more resistant to cigarette ignitions is an example of change that has already accomplished much and will continue to do more. Fifth, the special fire safety needs