Residential 13-D Installations
Statistics, Components, Construction, Results!

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- "Retired" 31 year fire service veteran
- Served as Battalion Fire Chief for 11 years and Fire Marshal for 5 years
- Former Director for the Northern California Fire Prevention Officer’s Association
- Former Co-chair of the Northern California Fire Prevention Officers Fire Equipment and Devices Committee
- Former President of the Solano County Fire Prevention Officers Association
- Current Member of OSM Title 29-NFPA 25 Ad Hoc Work Group
- Current Member OSM Automatic Extinguishing Systems Advisory Board,
- Former Interim Co-chair OSM/ESC Outreach for Fire Protection Systems Task Force
- Served on and co-authored two of the study groups on the OSM/ESC L.E., and IR/CTC.
- Assisted in writing the final report to the Office of the State Fire Marshal
- Co-developed and Co-taught "Preparing for the California Residential Code: Residential Fire Sprinkler Criteria for One and Two Family Dwellings and Townhouses, 2010 California Residential Code (Title 24, Part 2.5) class"
- Certified by the OSM/ESC as a Fire Marshal and Chief Officer
- Bachelor of Science degree in Management
- Master of Science degree in Emergency Services Administration

Residential Fire Statistics

A home catches fire in the United States every 79 seconds.

Tragically, on average, 87% of all fire deaths occur where most people feel the safest – in their home.

In 2006 alone:
- More than 396,000 home fires claimed the lives of more than 3,000 men, women and children.
- An additional 13,825 were injured.
- Property damage totaled more than $6,875,000,000.
Sprinkler System Components

- Water supply
- Meters and valves
- Piping
- Sprinklers
- Alarm (when required by AHJ)

Installing the Residential Fire Sprinkler System

- The system may be installed by a licensed contractor or an owner-builder per the CA. State Contractor License Board.

Connection to City Main

- Preferred
- Acceptable
Water Supply Options

Street Main
(probably the most common)

Preferable Arrangement

Acceptable Arrangement with Valve Supervision (option 1)

Note: Rubber Faced Check Valves are Optional

NFPA 13D Figure A.6.2(a) (07)
NFPA 13D Figure A.6.2(a) (02)
Acceptable Arrangement with Valve Supervision (Most Common in Ca.)

City Water Main
Waterflow Detector
Sprinkler Control Valve
Pressure Gauge
Water Meter
Main Control Valve
To Domestic System
Domestic Shutoff Valve
Rubber Faced Check Valve
To Automatic Sprinkler System
Drain and Test Connection

NFPA 13D Figure A.6.2(c) (07)
NFPA 13D Figure A.6.2(c) (02)

Meters

Neptune T-10
Meets or exceeds AWWA C-700
Piping Configurations

- Stand alone
  - Tree Systems (straight run)
  - Looped Systems
- Gridded Systems
- Multipurpose Piping System
- Passive Purge
- Mist Systems and Coming soon!

Stand alone

- Independent fire sprinkler and plumbing water distribution systems
- Tree
- Looped
  - Frequently provides improved hydraulic performance
- Separation of fire and plumbing systems can occur at different points in piping
A water distribution system that satisfies fire sprinkler and plumbing needs.
- Almost always connected to supply piping from a single tap
- Full integration of fire/plumbing
- Partial integration of fire/plumbing
- Plumbing demand in large homes may be greater than sprinkler system demand requirements
Passive Purge

- Sprinkler system piping that connects to a single, commonly used plumbing fixture.
- Almost always connected to supply piping from a single tap
- Tree system
- Looped/gridded system
Design Standards

System Components

- Riser
- Flow Switch
- Gauge
- Test Valve

System Components

- NSF 61 Drinking water
- Rated UL 1821
- CPVC Pipe or other approved material
  - copper
  - steel
- Hangers and Braces
Alternate Pipe

- Pipe may be copper, steel or other approved type
- Usually plastic pipes.

Sprinkler Heads

- Pendant
- Sidewall
- Upright
- Side wall
- Dome
- Flat Plate

PEX Systems
PEX Tube

Must be joined, installed, supported according to listing

Additional System Components

- When required by the AHJ
- Requires an amendment to the local ordinance
- Spare Head Box
- Gauge
- Flow switch
- Local alarm

Installation of the Fire Sprinkler System

- CPVC Pipe is one of the typical pipes used in installations
Will change to good installation pictures
BruceL, 11/8/2011
PEX Pipe

- Another common pipe used in 13D installations

Final Inspection and Acceptance Testing

- 2 Primary Inspections
- Rough Overhead
  - Pipe layout
  - Water flow and pressure
- Final Inspection
  - Test components
  - Check quality of installation
  - Check flow

Four Port Sprinkler Fitting

- Listed manifold
- ½” PEX Tubing
Rough In Inspection

- Rough in Inspection
  - Visual inspection
    - system installed per approved plan
  - Pressure Test
    - ensure that fittings are glued properly

Final Inspection of the Finished Product

- Walk the system to make sure it is installed correctly, aesthetically
- If required, operate flow switch to test the bell and make sure the system is pressurized.

How do Residential Sprinklers Work?

A single residential sprinkler can protect a room area up to 20' X 20’ – with an average house requiring only 20-30 sprinklers.

Each sprinkler protects the area below it. Only a threatening fire can generate enough heat to activate a sprinkler – typically at 155°F.

Only the sprinkler closest to the fire will activate, spraying water directly on the fire and the area that the sprinkler has been designed to protect.

Sprinklers can control or even extinguish the fire before it can build deadly heat and smoke so you and your family can escape safely, and limit damage to your home.
The Results of a Residential Fire Sprinkler System

In less than the time it would take a fire department to arrive on the scene, a single sprinkler can control or even extinguish the fire.

Maintenance

- The responsibility for maintenance of the system lies with the owner
- Recommendations for monthly maintenance are contained in the standard
  - Inspections of system components, testing of alarms, pumps & other system components, etc.
- Available Resources (www.homefiresprinkler.org)
- CRC Section here
- NFPA Section here
Summary

- Statistics show that sprinklers save lives
- Systems are economical and easily installed
- Systems are easily inspected and maintained

Most Simple System #1

- Stand alone Drawing (looped)
- Multi-purpose Drawing
- Passive Purge Drawing
  - What do we have to do to make this work out?