



DIVISION OF
FIRE AND LIFE SAFETY

CITY OF SCOTTSDALE

SCOTTSDALE FIRE DEPARTMENT

**Interpretations
And
Applications
of**

**NFPA 13, 13D, 13R (2007 edition)
NFPA 72 (2007 edition)**

EFFECTIVE: September 1, 2007

ORIGIN & DEVELOPMENT OF THE FIRE SPRINKLER ORDINANCE IN THE CITY OF SCOTTSDALE

The City of Scottsdale and Rural/Metro Fire Department held extensive fire sprinkler tests in 1982. The resulting tests demonstrated the reliability of listed residential quick response sprinkler heads to significantly reduce the potential for loss of life and property damage that can result from a fire.

On June 4th, 1985, the Scottsdale City Council passed an ordinance requiring all new building permits obtained for commercial and multi-family structures to be provided with an approved automatic fire sprinkler system.

New building permits obtained after January 1, 1986 for single family dwellings requires the installation of an approved automatic residential fire sprinkler system.

*Sprinklers typically reduce the chances of dying in a home fire by one half to two thirds in any kind of property where they are used. Together with [smoke alarms](#), sprinklers cut the risk of dying in a home fire 82 percent, relative to having neither.

The Interpretations and Applications Manual describes the requirements for the installation of automatic fire sprinkler systems for the current adopted standards of NFPA 13, 13D and 13R.

An additional supplement is included for the current adopted NFPA 72 Fire Alarm Standard.

For additional requirements see COS Amendments (Section 912) to the 2006 IFC at:
www.scottsdaleaz.gov/codes.asp.

* NFPA Link:

<http://www.nfpa.org/itemDetail.asp?categoryID=276&itemID=18249&URL=Research%20&%20Reports/Fact%20sheets/Fire%20protection%20equipment/Automatic%20sprinkler%20systems>

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INTERPRETATIONS & APPLICATIONS
OF THE 2007 MODIFIED NFPA 13

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CHAPTER 6 – SYSTEM COMPONENTS AND HARDWARE

6.9.3.1 SPRINKLER FLOW BELL REQUIREMENT **AMENDED**

The alarm unit shall be a red, listed 10 inch size electric alarm bell, located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire code official.

CHAPTER 8 – INSTALLATION REQUIREMENTS

8.3.3.1.1 THERMAL SENSITIVITY IN TENANT IMPROVEMENTS **ADDED**

In tenant improvement spaces with existing standard response sprinkler heads, all heads within the tenant improvement space shall be changed to quick response type sprinklers when more than 50% are added or relocated, unless allowed by section 8.3.3.3. See sections 8.3.3.2 and 8.3.3.4.

8.15.7.1.1 EXTERIOR ROOFS OR CANOPIES IN EDUCATIONAL OCCUPANCIES **ADDED**

In all Group E educational occupancies sprinklers shall be installed under attached canopies exceeding 4 ft. (1.2 m) in width regardless of construction methods or materials.

8.15.7.3 (4) FLAME SPREAD RATING OF FABRIC CANOPIES **ADDED**

(4) Fabric type shade canopies that bear a flame spread rating of Class A (0-25) are not required to be sprinklered.

8.15.8.1.1 NO SPRINKLER DELETIONS IN BATHROOMS **AMENDED**

There shall be no sprinkler deletions in bathrooms.

8.16.1.1.1.1 FIRE RISER DETAILS **ADDED**

See City MAG Supplements, Standard Detail Drawings 2367 and 2368 or 2369 at:
www.scottsdaleaz.gov/design/detaildrawings/sd2300series.asp.

8.16.1.1.2.5 CONTROL VALVE SUPERVISION *ADDED*

When off-site monitoring is not required or provided, the tamper device shall be wired to ring the local water flow bell.

8.16.1.1.2.6 SECTIONAL CONTROL VALVES PER FLOOR *ADDED*

A sprinkler system that serves two or more levels shall incorporate tampered sectional floor control valves.

A mezzanine that covers more than 1/3 of the building footprint shall require separate control valves.

8.16.1.1.7.1 FIRE RISER CLEARANCE *ADDED*

Provide and maintain 12 inch clear in back to walls or any other obstruction, 18 inch clear on each side and 36 inches clear in front of all riser piping, equipment and appurtenances.

- (1) Riser assemblies within riser rooms may be provided with alternate double doors or sliding doors that provide a minimum of 36 inches of riser assembly clear working space with doors in the open position.

8.16.1.1.7.2 INTERIOR FIRE RISER LOCATIONS *ADDED*

Interior fire riser locations:

- (1) Interior fire risers are to be located a maximum of 3 feet inside of an exterior wall foundation.
- (2) May be located in a riser room or,
- (3) Installed in a readily accessible (within 25 feet) and visible location from an exterior door,
- (4) Risers may be installed in an underground parking garage with prior written approval of the fire code official. When in an underground garage the riser(s) shall be no lower than the first level below grade in the vicinity of (within 25 feet), and clearly visible from a stair or ramp.
- (5) Storage, mercantile areas with storage exceeding 12 feet in height, and hazardous uses shall require the riser immediately adjacent (within 5 feet) to an exterior door and secured within a room, or other enclosure as approved by the fire code official.
- (6) Depending on hazards there is potential for a dedicated riser room with an exterior door.

8.16.1.1.7.3 EXTERIOR FIRE RISER LOCATIONS *ADDED*

Exterior fire riser locations require approval from the Planning Department if not enclosed in a maintenance yard or other enclosure that shields the riser from view.

8.16.1.1.7.4 MANIFOLD FIRE RISER LOCATIONS *ADDED*

All manifold riser control valves are to be installed in one location.

- (1) Other arrangements, such as main supply loops in underground parking garages supplying multiple individual buildings on top, may be allowed with preliminary written approval of the fire code official.

8.16.1.1.7.5 FIRE RISER LOCATION DIRECTIONAL SIGNAGE *ADDED*

In all cases appropriate signage directing responding personnel to the riser location is required. See 8.16.1.1.8.1 for signage requirements.

8.16.1.1.8.1 CONTROL VALVE IDENTIFICATION *ADDED*

Control valve locations shall be identified with signage of minimum 3 inch high white block letters and ¾ inch stroke on red background.

8.16.4.1.3.1 PROTECTION OF PIPING AGAINST FREEZING *ADDED*

A minimum of 2" pipe is an acceptable method of freeze protection.

8.17.1.8 FLOW SWITCH MONITORING REQUIREMENTS *ADDED*

Where off-site monitoring is not required or provided the flow switch shall be wired to ring the electric water flow bell.

8.17.1.8.1 FLOW SWITCH MONITORING MULTIPLE FLOORS *ADDED*

A sprinkler system that serves two or more levels shall incorporate flow switches per floor.

- (1) When a single dwelling unit occupies multiple floors, separate tampered control valves and flow switches may not be required. Written approval from the fire code official shall be obtained for this exception.

8.17.2.3 (4) FIRE DEPARTMENT CONNECTION SIZE *ADDED*

- (4) If fire sprinkler design indicates demand of 1000 GPM or greater, the underground fire department connection line shall be increased to 6" diameter with a three (3) way 2 ½ inch fire department hose connection. See City MAG Supplements, Standard Detail Drawings 2367 and 2368 or 2369 at:
www.scottsdaleaz.gov/design/detaildrawings/sd2300series.asp.

8.17.2.4.6.1 FIRE DEPARTMENT CONNECTION LOCATIONS *ADDED*

Fire Department Connections shall be in accordance with Scottsdale Revised Code and located as follows:

- (1) Wall mounted Fire Department Connections shall have the bell located above.
- (2) Fire Department Connections for H occupancies, as defined in the 2007 IFC shall be located within 150' of a fire hydrant. For all other occupancies the FDC shall be located within 350' of a fire hydrant.
- (3) When systems are supplied by a private water main loop, Fire Department Connections shall be located within 350 feet of a fire hydrant, served by a separate public water main system.
- (4) Multiple Fire Department Connections supplying a fire sprinkler system shall be located accessible to fire operations staging areas, or at least 40 feet apart.

8.17.2.4.6.2 MULTIPLE FIRE DEPARTMENT CONNECTION REQUIREMENTS *ADDED*

The fire code official may require multiple Fire Department Connections. Such determinations are made during the building plan review process based on the following conditions:

- (1) There is a potential for impairment of one Fire Department Connection such as vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access to a single FDC,
- (2) When there are multiple buildings on top of an underground parking garage served by a private fire supply loop,
- (3) When fire operation staging areas are required.

8.17.4.6.1.1 BACKFLOW DEVICES *ADDED*

A UL classified, FM listed or ASSE approved vertical backflow preventer (double check backflow preventer assembly) shall be used as the main control valve and as the system check valve when supplied by a public water system. See City MAG Amendments Details (aka City Standard Details) 2368 & 2369.

8.17.4.6.1.2 BACKFLOW ON MULTIPLE FEED FIRELINES *ADDED*

When firelines supply multiple buildings there may be (1) one approved backflow preventer installed in the line above ground exterior of the building, when approved by the Planning Department.

8.17.5.2.1.1 HOSE CONNECTIONS *ADDED*

Hose connections shall be in accordance with Scottsdale Revised Code.

Exterior wall mounted hose valves shall be located a minimum of 5 feet from glazed openings.

CHAPTER 9 – HANGING, BRACING, AND RESTRAINT OF SYSTEM PIPING

9.3.1.1.1 SEISMIC REQUIREMENTS *ADDED*

Unless otherwise provided or exempted by the engineer of record, or when otherwise approved by the building code official, the seismic provisions of NFPA 13 for sprinkler systems will be required when the statement of special inspections includes items of 2006 IBC 1705.3 as elements requiring special inspection. Such determinations are made during the building plan review process.

Seismic requirements may be required, but not necessarily limited to the following examples:

- (1) high rise
- (2) hospitals
- (3) police stations
- (4) fire stations
- (5) large structures

CHAPTER 11 – DESIGN APPROACHES

11.1.1 ADDITIONAL AUTHORITIES HAVING JURISDICTON **AMENDED**

A building or portion thereof shall be permitted to be protected in accordance with any applicable design basis at the discretion of designer unless specifically addressed by Scottsdale Revised Codes and/or Standards Interpretations and Applications. Then the specific design basis shall be used unless otherwise approved by the fire code official.

- (1) State licensing of institutional and care facilities and the underwriter's fire insurance rating criteria may vary from National Fire Protection Association, City ordinances and Fire Department Interpretations & Applications. The fire code official will accept more stringent design densities, but in no case will the criteria be below NFPA, local codes or department standards. All engineering will be subject to review and approval by the fire department.
- (2) Use of materials and appliances should be verified prior to design by insurance underwriter, if applicable. Penalties may occur with some materials.

11.2.3.1.1 (4) ROOM DESIGN METHOD RESTRICTION **ADDED**

- (4) The room design method in 11.2.3.1.1 (2) and 11.2.3.3.1 (1) shall only be used with pre-approval from the fire code official.

11.2.3.3.1 ROOM DESIGN METHOD RESTRICTION **ADDED**

The room design method shall only be used with pre-approval from the fire code official based on probability that rooms will not be increased in size.

CHAPTER 12 – GENERAL REQUIREMENTS FOR STORAGE

12.1.3.1 UNSPECIFIED STORAGE SHELL DESIGN **ADDED**

Design criteria for unspecified storage areas shall be designed for a ceiling density of .45 gpm / ft² per 3000 ft² at 20 feet measured from 4 feet from bottom of deck.

Use figure 14.2.4.3 to adjust the density up or down based on maximum potential storage height. Other proposals may be considered by the Fire Code Official.

CHAPTER 21 – SPECIAL OCCUPANCY REQUIREMENTS

21.37 LIMITED USE SALES TRAILER DESIGN **ADDED**

Limited use sales trailers (light hazard) may install QR commercial sprinkler heads fed off the domestic supply with a two head flow calculation.

21.38 BUSINESS OCCUPANCIES IN RENOVATED RESIDENTIAL STRUCTURES *ADDED*

Existing R-3 occupancies renovated and re-classified as Group B office occupancy may be equipped with a light hazard commercial sprinkler system utilizing a four head flow calculation.

CHAPTER 22 – PLANS AND CALCULATIONS

22.1.1.1 SUBMITTAL REQUIREMENTS *ADDED*

New construction and remodel plans submitted to the City shall comply with the following:

- (1) Submit a minimum of 3 sets of all working drawings.
- (2) Submit one set of hydraulic calculations and manufacturer data sheets for all equipment, i.e. sprinkler heads and backflow preventer.
- (3) Acceptable paper size shall be limited to 24 x 36 or 30 x 42.
- (4) Minimum scale shall be 1/8".
- (5) All submittals shall bear a dated review certification and signature of a minimum level III NICET certified engineering technician (CET) automatic sprinkler systems or an Arizona Registered Professional Engineer.
- (6) Deviations from approved plans will require approval from the fire code official.

For digital plan submittals; see the City of Scottsdale website at:

<http://www.scottsdaleaz.gov/bldgresources/digital.asp>

22.1.3 WORKING PLANS (47) THROUGH (58) *ADDED*

- (47) A complete site plan including all applicable city notes, the Development Review case number (DR#) and calculation nodes.
- (48) One current city approved civil fire line plan shall be submitted for reference.
- (49) A current permitted flow test, submitted on the City Flow Test Summary Form is required.
- (50) Where systems are supplied by a municipal or private water system, calculation shall maintain a 10% safety margin from the field water pressure test. The slope of the current flow test water supply curve shall be used. Calculated system demand shall not exceed 72 psi.
- (51) Phone number of contractor and/or designer on plans with instructions whom to call to pick up plans.
- (52) All system shall be reviewed and signed by a minim level III NICET CET Automatic Sprinkler System or an Arizona Registrant knowledgeable in fire protection.
- (53) For light steel construction the hangar analysis from a Structural Engineer is required.
- (54) When the city has determined that seismic zone requirements apply to a structure, the hangar analysis prepared by the Structural Engineer of record is required.
- (55) Owner's Information Certificate.
- (56) Registrants Activities Report when required by the professional registrant in charge and/or fire plan review and/or the fire code official – see State law and IBC for deferred submittals. IFC 104.7.2, IBC 106.1, 106.3.4.1.
- (57) Technical opinion and report when required by the professional registrant in

charge and/or fire plan review and/or the fire code official and/or the building code official – may be required for hazardous conditions. IFC 104.7.2, IBC 106.1, 106.3.4.1.

- (58) Professional registrant in charge determination that deferred submittal document is in general conformance to the design of the building, may be required by fire plan review and/or the fire code official. IFC 104, IBC 104, 106.3.4.

22.1.6 TENANT IMPROVEMENT SUBMITTALS *ADDED*

Working plans shall be submitted for approval to the authority having jurisdiction before any equipment is installed or remodeled. See 22.1.1 through 22.1.3.

- (1) No submittal is required for adding or relocating 3 heads or less.
- (2) Field inspection is required.

22.1.7 FLEXIBLE TUBING TENANT IMPROVEMENT SUBMITTALS *ADDED*

The use of flexible tubing product for tenant improvements will be allowed only when the following guidelines are met:

- (1) Drawings are required anytime this product is utilized.
- (2) Hydraulic calculations are required if the product friction loss is greater than the existing pipe.
- (3) Manufacturer's data sheet required with submittal.

22.4.4.7 (11) FLOW SWITCH LOSS *ADDED*

- (11) Pipe sizes 2" or less shall include 3 PSI fixed loss for the flow switch, or per manufacturer specifications.

22.5 PIPE SCHEDULE PROHIBITED *AMENDED*

The pipe schedule method shall not be permitted for use in any occupancy for new sprinkler systems, existing systems or extensions to existing systems.

23.1.6.2.1 CONNECTION PASSING THROUGH OR UNDER FOUNDATION WALLS *ADDED*

All firelines entering a building must enter the building as close as possible to within 36 inches to the inside face of an exterior wall.

The bottom of the pipe flange shall terminate a minimum of 6" above the finished floor.

23.2.6 LISTED UNDERGROUND PIPING *ADDED*

All fire line piping, off-site and on-site, shall be listed for fire protection service and installed per NFPA 24, City of Scottsdale Design Standards and Policy Manual
<http://www.scottsdaleaz.gov/design/dspm.asp>

24.2.1.5.1 COMMERCIAL TENANT IMPROVEMENT PRESSURE TESTING *ADDED*

When the installing contractor does not elect to isolate the new portion then the entire system shall be tested at not less than 150 psi for 2 hours.

24.2.1.6.1 TESTING NEW DROPS *ADDED*

Modifications affecting more than 20 new drops shall be pressure tested at not less than 150 psi for 2 hours.

24.7 CPVC CERTIFICATION CARD REQUIREMENT *ADDED*

Installation of CPVC pipe requires the factory issued certification card to be carried by the pipe fitter during installation and is to be made available to an inspector upon request. The installer shall follow all manufacturer guidelines for installation.

26.2 RE-INSPECTION FEES & CANCELLATIONS *ADDED*

A re-inspection fee will be assessed for each re-inspection, not necessarily limited to the following:

- (1) When installation is not complete.
- (2) When corrections from previous inspection are not complete.
- (3) When two or more appointments have been cancelled at the same address.
- (4) Late notice of cancellation. (less than 2 hrs prior)

26.3 CANCELLATION CALLS TO SCHEDULER *ADDED*

Cancellation calls shall be made to scheduler, not inspectors.

INTERPRETATIONS & APPLICATIONS
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CHAPTER 4 – GENERAL REQUIREMENTS

4.1.2.1 LINTELS **ADDED**

Large, beamed ceilings are not intended to be given credit as a compartment enclosure, even if they have an 8" depth. The openings from the compartment are generally based on a 36" wide door opening.

4.8.1 WORKING PLANS **ADDED**

A scaled drawing shall show the following:

- (1) Address
- (2) Size and type of domestic line, including length to city connection
- (3) Water meter size
- (4) Current static water pressure (Current within 6 months of submittal date)
- (5) Interior walls
- (6) Model, manufacturer, temperature, orifice size and spacing requirements of sprinkler
- (7) Type of pipe
- (8) Hanger spacing requirement per the pipe manufacturer
- (9) Riser detail
- (10) Head symbol legend
- (11) Installing contractor information
- (12) Hydraulic calculation data
- (13) Room names
- (14) Ceiling heights, ceiling height changes
- (15) Sloped ceilings exceeding 2:12. Indicate "no sloped ceilings" if applicable
- (16) Beam sizes and soffit depths
- (17) Dimensioning of heads as necessary for determining proper head spacing
- (18) Pipe lengths, center to center
- (19) Clearly identified calculated areas (On plans & calculations)
- (20) Inspectors test
- (21) Riser location
- (22) Electric bell location
- (23) General notes as required
- (24) All sheets shall be sized the same

4.9 SUBMITTAL REQUIREMENTS *ADDED*

New construction and remodel plans submitted to the City shall comply with the following:

- (7) Submit a minimum of 3 sets of all working drawings
- (8) Submit one set of hydraulic calculations and manufacturer data sheets
- (9) Acceptable paper size shall be limited to 24 x 36 or 30 x 42, minimum scale shall be 1/8"
- (10) All submittals shall bear a dated review certification and signature of a minimum level III NICET certified engineering technician (CET) automatic sprinkler systems or an Arizona Registered Professional Engineer
- (11) An approved set of plans shall be at the structure at the time of scheduled inspections. Deviations from approved plans will require approval of the fire chief.

4.9.1 REMODEL/ADDITIONS SUBMITTAL *ADDED*

Remodel and additions submitted to the City when calculations are not required:

- (1) When calculations are not required, submittals may be faxed or emailed (PDF or DWF format) on a scaled floor plan (3/16" minimum) 8-1/2 x 11" size paper
- (2) No NICET or P.E. stamp is required
- (3) The scope of work must be clear & demonstrated that no calculations are necessary
- (4) Fax submittals shall be limited to one sheet

4.9.2 REMODEL/ADDITIONS INFORMATION *ADDED*

Information provided on remodel and addition submittals shall include but not limited to:

- (1) Project information
- (2) Meter size
- (3) Underground size and length
- (4) Current static PSI
- (5) Existing and new head type

Note: If the original sprinkler system was installed at less than a .05 density, calculations will be required when using other than an approved replacement head, unless it is obviously close to the riser.

For digital plan submittals; see the City of Scottsdale website at:
<http://www.scottsdaleaz.gov/bldgresources/digital.asp>

4.10 TESTS AND INSPECTIONS *ADDED*

4.10.1 ROUGH INSPECTION *ADDED*

- (1) All components of the system shall be in place, secured and connected to the water supply at the time of test.

- (2) All new systems shall be tested using a cold water test / minimum of 175 PSI for 24 hours. System must show adequate pressure per approved plans. No visible leakage or pressure reduction is permitted.
- (3) When adding/relocating 4 or more heads to an existing system, it shall be tested using a cold water test / minimum of 140 PSI for 24 hours. 3 heads or less shall be connected to the permanent water supply for 24 hours prior to inspection.
- (4) All fire penetrations should be filled with approved material and nail plates shall be in place at the time of the pressure test. Where metal studs are used piping shall be protected with either a sleeve or grommet.
- (5) Systems tested with sprinkler heads installed at time of test may have up to 10% of the heads removed for orifice obstruction inspection. (Not required if plugs are used) If solvent glue or other foreign objects are found within the sprinkler head at time of inspection, then the system shall be tested using plugs in lieu of sprinkler heads. The sprinkler contractor will then be required to install all sprinkler systems using plugs in lieu of sprinkler heads for a period of one year from that date for each inspection.
- (6) An approved set of sprinkler plans shall be on the job site at the time of inspection.

4.10.2 FINAL INSPECTION ADDED

- (1) At the final inspection all sprinkler system components shall be in place, and the system shall be flowed with the activation of the flow switch and bell.
- (2) All risers shall have a calculation sticker and appropriate spare heads installed in the riser compartment. See Appendix "B" for calculation sticker detail.
- (3) Fire Department Inspection form from rough-in inspection must be on the job site at the time of test if there was a stipulation for rough-in approval.
- (4) Verify manufacturers head tolerance with the escutcheon in place and check for paint, obstructions, plaster, etc.

4.10.3 RE-INSPECTION FEES ADDED

A re-inspection fee may be assessed for each inspection or re-inspection, not limited to the following:

- (1) When installation is not complete.
- (2) When corrections from previous inspection are not complete.
- (3) When two or more appointments have been cancelled at the same address.
- (4) Late notice of cancellation (less than 2 hrs prior).

4.11 CPVC CERTIFICATION ADDED

When installing CPVC piping, the factory issued certification card must be carried by the pipe fitter during installation and is to be made available to an inspector upon request.

CHAPTER 6 – WATER SUPPLY

6.2.2.1 PUMP SYSTEM CRITERIA FROM CITY WATER SUPPLY ADDED

- (1) A combination pump system supplying both the domestic water and the fire sprinkler system shall be required.
- (2) A bypass line shall be installed.
- (3) Submit manufacturer's specifications for the pump, including the pump curve.
- (4) See Appendix "C" for an example of a pump system from city water supply.

6.2.2.2 PUMP SYSTEM CRITERIA FROM WELL AND/OR STORED WATER SUPPLY *ADDED*

- (1) A combination pump system supplying both the domestic and fire sprinkler system shall be required.
- (2) A low water alarm shall be actuated when the water level drops to the minimum quantity specified for the fire sprinkler system. The low water alarm shall be audible and installed in a central location of the normally occupied livable structure. The alarm shall produce a sound pressure of 15 decibels above ambient noise levels.
- (3) An FDC shall be installed below the electric bell, accessible to the Fire Department. (National Standard Hose thread with an 1-1/2" snoot)
- (4) Submit manufacturer's specifications for the pump, including the pump curve.
- (5) See Appendix "D" for an example of a pump system from well water supply.

6.3 MULTIPURPOSE PIPING SYSTEM *AMENDED*

- (1) In common water supply connections, 5 GPM per dwelling unit shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler.
- (3) Piping connected to the system that supplies only plumbing fixtures shall comply with local plumbing and health authority requirements and shall be listed.
- (6) Where water treatment and filtration are installed, one of the following conditions shall be met:
 - (a) The flow restriction and pressure loss through the water treatment equipment shall be taken into account in the hydraulic calculations.
 - (b) An automatic listed bypass valve shall be installed around the water treatment equipment that directs all water directly to the system.

CHAPTER 7 – INSTALLATION

7.1.4 FIRE RISER COMPONENTS *ADDED*

The components of a riser assembly include the following:

- (1) Aboveground horizontal or vertical pipe between the water supply, the cross mains or feed mains
- (2) A combination control valve installed prior to the fire sprinkler and domestic supply tee (See Appendix "A" for Residential Riser Detail)
- (3) Rubber faced check valve
- (4) Pressure gauge
- (5) Main drain with a pressure relief valve
- (6) Supervisory capable electric flow switch

7.1.4.1 FIRE RISER ASSEMBLY LOCATION AND ACCESS *ADDED*

- (1) The riser shall be constructed within a garage or other secured location as approved by the fire code official or within a wall cabinet or other acceptable enclosure with an access panel or door suitable for access to all riser components.
- (2) All riser assemblies shall be braced and secured.

(3) Plastic systems shall be protected from damage up to 7 feet from floor level.

7.2.1 DRAIN *AMENDED*

- (1) Each sprinkler system shall have a drain on the system side of the control valve.
- (2) The main drain shall be 1/2 inch or larger, located above the check valve and flow switch.
- (3) There shall be a fixed non-adjustable pressure relief valve branched off of the main drain that will activate at pressures no lower than 150 PSI and no higher than 175 PSI.

7.2.4 INSPECTOR'S TEST CONNECTION *AMENDED*

- (1) Each sprinkler system shall have an inspector's test valve and drain connected at the highest most remote possible point in the system.
- (2) Piping shall be the same size as the piping to the most remote sprinkler head.
- (3) Underground sprinkler supply pipe servicing detached structures, shall be provided with an inspector's test. This may be used as the only inspector's test if it is a remote location.

7.2.5 INSPECTOR'S TEST ORIFICE SIZE AND LOCATION *AMENDED*

- (1) The test valve shall have an orifice the same size as the remote sprinkler head.
- (2) The test valve shall be constructed within a wall cabinet or other acceptable enclosure with an access panel or door.
- (3) The test valve shall be accessible to the fire department in such a place where it will not sustain damage and where water can be flowed without damage to the structure or contents.
- (4) Discharge shall be above grade and unobstructed.
- (5) Discharge from the orifice shall be confined to the property.

7.3.2.1 PRESSURE GAUGE *ADDED*

The gauge shall be installed on the system side of any system.

7.5.5.3 (4), (5) USE OF INTERMEDIATE TEMPERATURE RATINGS *ADDED*

- (4) Intermediate temperature rated residential sprinkler heads (175° F) shall be installed in mechanical rooms, garages and small laundry closets without a/c
- (5) 200° commercial quick response small (7/16") orifice heads may be used in mechanical and/or storage rooms that are isolated and accessible on the exterior face of the structure.

7.5.8.1 SOLVENT CEMENT *ADDED*

The head adaptor/drop nipple assembly shall be pre-fabricated prior to installation to ensure the sprinkler orifice remains free of obstructions.

7.6 ALARMS *AMENDED*

Local water flow alarms shall be provided on all sprinkler systems as follows:

- (1) A 110 volt AC 6 inch minimum size electric bell shall be supplied by house current
- (2) A dedicated circuit or GFI is not permitted

- (3) The bell shall be mounted on the exterior of the structure, visible from the street and not more than 3 feet from the front
- (4) The bell must be at a height to view easily from the street or drive and no higher than the plane made by the bottom of the eaves
- (5) The alarm shall receive its' signal from a UL listed local water flow switch
- (6) Color: Red

7.7.1 THERMAL PROTECTION *ADDED*

CPVC may be installed the vertical and/or horizontal position to protect mechanical units in open attic spaces, however, it shall be protected with a noncombustible insulation molded to fit the pipe diameter. The insulation shall be compatible with CPVC pipe.

Surface burning characteristics shall be in accordance with the following specifications:

Shall not exceed 25 Flame Spread, 50 Smoke Developed when tested in accordance with ASTM E 84, CAN/ULC S102-M88.

Note: Copper pipe may be installed in the same manner as CPVC in open attic spaces. Insulation products used for either copper or CPVC shall be rated to protect from freezing down to minimum temperatures of 0° F.

7.8 UNSUPERVISED PIPE *ADDED*

Unsupervised sprinkler pipe in residential structures:

- (1) Residential sprinkler systems shall not have unsupervised pipe more than four (4) feet in length within a wall adjacent to livable space and/or no more than ten (10) feet in length in a wall that does not have a livable space on either side.
- (2) The pipe will be measured from the point of entry; both horizontally and vertically, up to the center of the flow switch on the riser.

CHAPTER 8 – SYSTEM DESIGN

8.1.5 SPECIAL DESIGN APPROACHES *ADDED*

8.1.5.1 CEILINGS WITH EXPOSED BEAMS *ADDED*

Ceilings w/ exposed beams – Follow manufacturers listing requirements for “beamed ceiling sprinklers”.

(1) Design challenge #1 when drilling beams:

Sloped ceilings (4:12 max.) w/ beams using a listed head for beams – Calculate the next higher GPM listed for the sprinkler head selected or an additional head may be calculated. Following the specific coverage criteria is permitted. The designer will select which option is being utilized and state that option on the plan.

(2) Design challenge #2 when drilling beams:

Sloped ceilings (Over 4:12 – 8:12 max.) w/ beams using a listed head for beams – An additional head shall be calculated. Following the specific coverage criteria is permitted. The designer shall state the requirement on the plan.

- (3) **Design challenge #3 when installing heads between beams:**
Calculate 3 heads with the listed coverage criteria when unable to maintain 8' minimum between sprinklers. The designer shall state the requirement on the plan.
- (4) **Design challenge #4 when beam length and/or spacing parameters exceed testing approvals:**
Calculate the next higher GPM listed for the sprinkler head selected or an additional head may be calculated.

Note: Until further testing has been conducted for residential fire sprinkler systems, design challenges that require sprinkler heads to be installed in non-listed applications, the City of Scottsdale Fire and Life Safety Division will be requiring that the 2007 Edition of NFPA 13-D section A.8.1.2 be considered when designing systems.

These guidelines are for some of the most common design challenges. The designer/engineer will address other design challenges on a case-by-case basis.

8.1.5.2 COFFERED CEILINGS/SOFFITS ADDED

- (1) A.8.1.2 provides guidance for design scenarios when NFPA 13-D Standards & specific head listings do not accommodate a particular design feature. NFPA 13 may be referenced for determining maximum ceiling pocket depth of 36" before requiring a head to be placed at the high point of the ceiling.
- (2) When faced with a design challenge of installing heads on other than smooth-flat ceilings, i.e. installing heads in coffered ceilings, Annex A, sec. A.8.1.2 may be applied by choosing the next higher GPM listed for the sprinkler head selected or an additional head may be calculated. The designer will select which option is being utilized and state that option on the plan.
- (3) Residential sprinkler heads with a specific listing for beamed ceilings may be installed in lowest architectural soffit feature of a coffer with a maximum depth of 14" in. from the high point of the ceiling. Following the specific coverage criteria is permitted.

NOTE: NFPA 13-D section 8.6.7 may be used in lieu of the above requirement.

8.1.6 RESIDENTIAL BARNES ADDED

- (1) 1501-5000 square foot barns may be piped from the domestic service. Calculate a minimum of two commercial QR heads using the area/density method per NFPA 13. Install in accordance with NFPA 13 Standards.
- (2) 5001 square foot barns and above shall require a separate fire line service connected to a city water main. Install in accordance with the City of Scottsdale Interpretations and Applications and NFPA 13. Calculate 4 heads.

8.1.7 DETACHED STRUCTURES ADDED

Detached garages, guest houses, and similar structures exceeding 1500 square feet, shall require a separate water supply, fire sprinkler riser, inspector's test and electric bell.

8.1.8 EXTENDING EXISTING SYSTEMS TO NEW ADDITIONS *ADDED*

Extending an existing fire sprinkler system to an attached new addition may be done in the following manner:

- (1) Connect into the existing piping system.
- (2) Connect a new supply line at top of the existing fire sprinkler riser and run the pipe overhead or underground to the point of connection.
- (3) Other proposals will be considered on a case by case basis.

Note: See sections 4.10, 4.10.1 & 4.11 for submittal requirements.

8.4.2.1 FLOW SWITCH LOSS *ADDED*

Pipe sizes 2" or less shall include 3 PSI fixed loss for the flow switch, or per manufacturer specifications.

A.8.4.3.3 NETWORK SYSTEMS *AMENDED*

- (11) In common water supply connections, 5 GPM per dwelling unit shall be added to the sprinkler system demand to determine the size of common piping.
- (12) Piping runs shall be installed per manufacturer's color coding for ease of inspection.
- (13) Where water treatment and filtration are installed, one of the following conditions shall be met:
 - (a) The flow restriction and pressure loss through the water treatment equipment shall be taken into account in the hydraulic calculations.
 - (b) An automatic listed bypass valve shall be installed around the water treatment equipment that directs all water directly to the system.

8.4.4 (6) PRESSURE LOSS FROM CITY MAIN TO INSIDE CONTROL VALVE *AMENDED*

- (6) A minimum of 5 feet shall be calculated from the city main to the meter. Pressure losses from the city main to the inside control valve shall be deducted by multiplying the factor from Table 8.4.4 (a) or Table 8.4.4 (b) by the total length(s) of pipe in feet (meters). [The total length includes equivalent length of fittings as determined by applying Table 8.4.4 (c), Table 8.4.4 (d), Table 8.4.4 (e), or Table 8.4.4 (f).]

8.4.4 (12) PRESSURE SAFETY MARGIN *ADDED*

- (12) Calculations shall maintain a 10% pressure safety margin from the field water pressure tests. The pressure used for hydraulic calculations shall not exceed 72 psi. The purpose for this practice is to account for water pressure fluctuations. When additional fittings have been installed in a sprinkler system not accounted for in the design, revised drawings may be required with new calculations.

8.4.4 (13) COMMON WATER SUPPLY CONNECTIONS *ADDED*

- (13) In common water supply connections, 5 gpm per dwelling unit shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements.

8.4.4 (14) DOMESTIC WATER SUPPLY *ADDED*

(14) Domestic water supplies shall be 1" minimum size in new construction.

8.4.4 (15) PRESSURE REDUCING VALVE *ADDED*

(15) Pressure reducing valve installations shall be installed on the domestic side of the tee.

SECTIONS: 8.6.2, 8.6.4 *DELETED*

8.6.1 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall be installed in all areas including, but not limited to:

- (1) Garages
- (2) Attached carports
- (3) Bathrooms
- (4) Entrance foyers
- (5) Water heater closets
- (6) Utility and mechanical closets
- (7) Washer-dryer closets
- (8) All accessible areas under stairs and landings
- (9) Closets under stairways
- (10) Area beneath stairway when open to the room
- (11) Covered patios when there is livable space above the patio (Entire patio)
- (12) In close proximity to mechanical units (any heat producing unit) located in attic spaces. Coverage shall include two sides of each mechanical unit if the head can not be installed above the unit. Use 200° QR 7/16 orifice commercial heads. Install 1 – 12 inches from deck.
- (13) Where an attached built-in barbeque with open attic space is constructed, a 200° QR 7/16 orifice commercial head shall be provided in an approved location in close proximity to where the flue passes through the roof structure.

8.6.3 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers are not required in clothes closets, linen closets, pantries, dumbwaiters, laundry chutes and storage rooms that do not contain electrical or mechanical equipment that meet the following conditions:

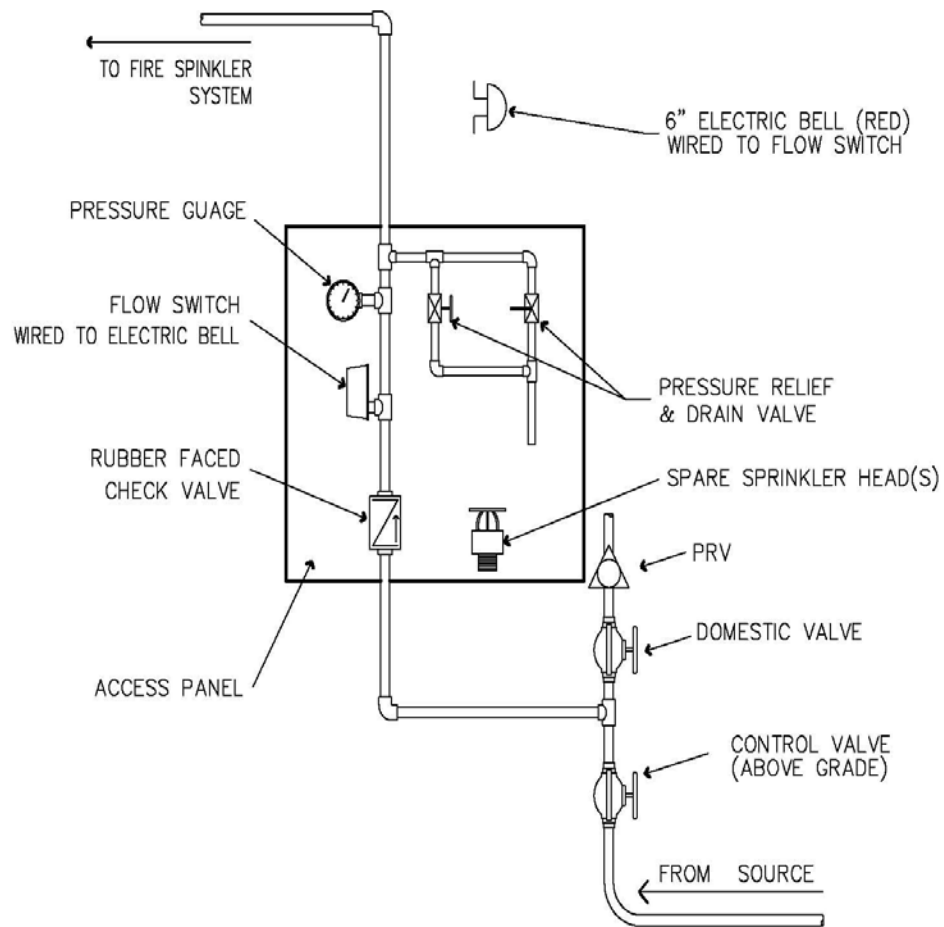
- (1) The area of the space does not exceed 24 ft².
- (2) The least dimension does not exceed 3 ft.
- (3) The walls and ceilings are surfaced with noncombustible or limited –combustible materials as defined in NFPA 220, *Standard on Types of Building Construction*.

8.6.5 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall not be required in:

- (1) Elevator machine rooms
- (2) Floor/ceiling spaces
- (3) Elevator shafts
- (4) Crawl spaces and other concealed spaces that are not used or intended for living purposes and do not contain fuel-fired equipment

RISER DIAGRAM



NOT TO SCALE

APPENDIX "A"

CALCULATION DESIGN STICKER FOR 13-D

ABC SPRINKLER CO.
1234 N. SCOTTSDALE RD.
SCOTTSDALE, AZ.

PHONE: 000-000-0000

HYDRAULIC CALCULATION DATA

BASED ON WATER PRESSURE OF
_____ @ RISER

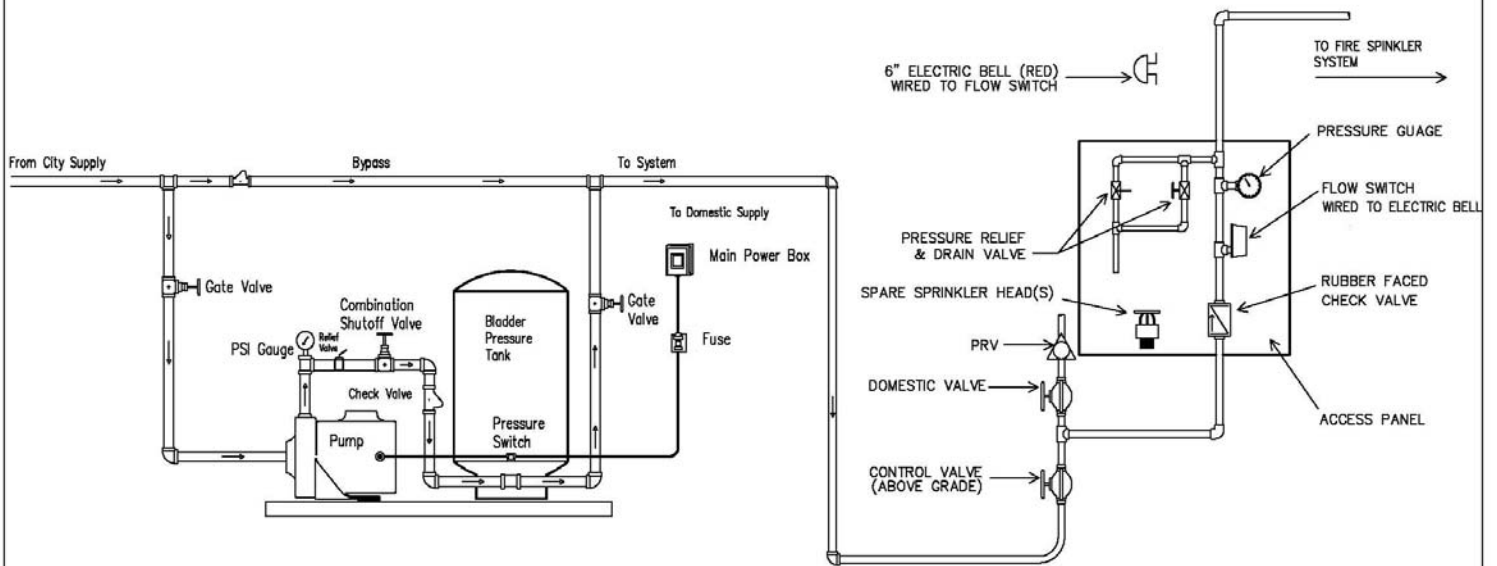
TWO HEAD CALCULATION:
_____ GPM @ _____ PSI

ONE HEAD CALCULATION:
_____ GPM @ _____ PSI

MINIMUM SIZE: 3" X 5"

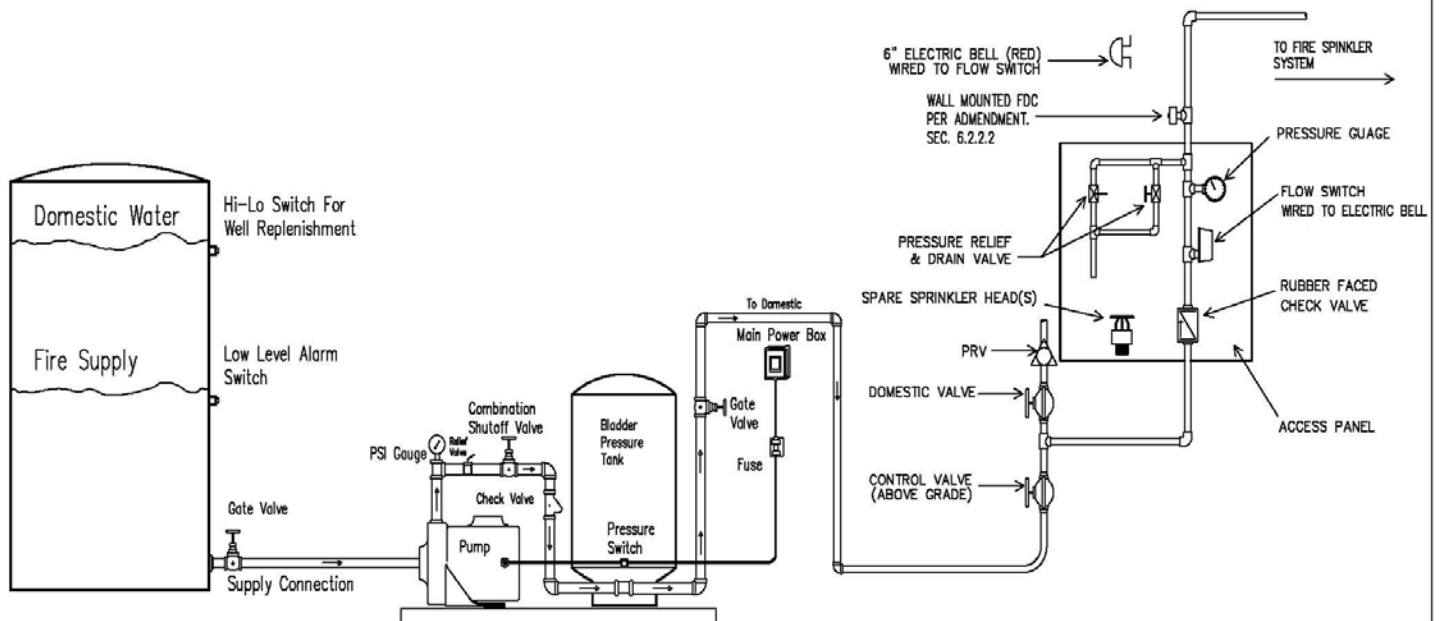
APPENDIX "B"

EXAMPLE OF A COMBINATION FIRE/DOMESTIC PUMP SYSTEM FOR CITY WATER SUPPLY



APPENDIX "C"

EXAMPLE OF A COMBINATION FIRE/DOMESTIC PUMP SYSTEM FOR WATER STORAGE TANK



Sprinkler System Design using Tyco LF II
 16 X 16 spacing 14 GPM @ 11.1 PSI
 33 GPM (2 Heads flowing)
 X 15 minutes = 495 Gallons
 X 1.1 (10% buffer) = 545 Gallons
 600 gallons required for sprinkler system.

The tank size shall be determined by the fire
 sprinkler requirement, in addition to domestic use.

APPENDIX "D"

INTERPRETATIONS & APPLICATIONS
OF THE 2007 MODIFIED NFPA 13-R

Revised: 09-01-07



CHAPTER 5 – SYSTEM COMPONENTS

5.4 FIRE RISER COMPONENTS & LOCATION *ADDED*

- (1) The fire riser shall be at an accessible location approved by the fire code official from a fire access road or driveway.
- (2) The fire riser shall be constructed within a cabinet or other secured location as approved by the fire code official.
- (3) An access panel or door suitable for access to all riser components shall be provided.
- (4) Plastic systems shall be protected from damage up to 7'0" from floor level.
- (5) Building number identification shall be provided at the riser location.
- (6) Hydraulic calculation data plate shall be required.

CHAPTER 6 – WORKING PLANS, DESIGN, INSTALLATION, ACCEPTANCE TESTS AND MAINTENANCE

6.2.3 SUBMITTAL REQUIREMENTS *AMENDED*

New construction and remodel plans submitted to the City shall comply with the following:

- (12) Submit a minimum of 3 sets of all working drawings
- (13) Submit one set of hydraulic calculations and manufacturer data sheets for all equipment, i.e. sprinkler heads and approved backflow prevention.
- (14) Acceptable paper size shall be limited to 24 x 36 or 30 x 42, minimum scale shall be 1/8"
- (15) All submittals shall bear a dated review certification and signature of a minimum level III NICET certified engineering technician (CET) automatic sprinkler systems or an Arizona Registered Professional Engineer
- (16) Deviations from approved plans will require approval of the fire code official.

For digital plan submittals; see the City of Scottsdale website at:

<http://www.scottsdaleaz.gov/bldgresources/digital.asp>

6.2.7 WORKING PLANS *AMENDED*

- (25) Hydraulic calculation data
- (26) Ceiling heights; ceiling height changes
- (27) Sloped ceilings exceeding 2:12. Indicate "no sloped ceilings" if applicable
- (28) Beam sizes and soffit depths

- (29) Dimensioning of heads as necessary for determining proper head spacing
- (30) Clearly identified calculated areas (On plans & calculations)
- (31) Inspector's test
- (32) Riser location
- (33) Riser detail
- (34) General notes as required
- (35) City of Scottsdale Flow Test Summary Form at:
<http://www.scottsdaleaz.gov/bldgresources/forms.asp#f>

6.4.3 TEST AND INSPECTIONS ADDED

6.4.3.1 ROUGH-IN INSPECTION ADDED

- (1) All tests shall be witnessed by Scottsdale Fire Department.
- (2) All components of the system shall be in place, secured and connected to the water supply at the time of the test.
- (3) All fire penetrations should be filled with approved material and nail plates shall be in place at the time of the pressure test. Where metal studs are used piping shall be protected with either a sleeve or grommet.
- (4) Systems tested with sprinkler heads installed at time of test may have up to 10% of the heads removed for orifice obstruction inspection. (Not required if plugs are used) If solvent glue or other foreign objects are found within the sprinkler head at time of inspection, then the system shall be tested using plugs in lieu of sprinkler heads. The sprinkler contractor will then be required to install all sprinkler systems using plugs in lieu of sprinkler heads for a period of one year from that date for each rough inspection.
- (5) An approved set of sprinkler plans shall be on the job site at the time of inspection.

6.4.3.2 FINAL INSPECTION ADDED

- (1) At the final inspection all sprinkler system components shall be in place, and the system shall be flowed with the activation of the flow switch and bell
- (2) All risers shall have a hydraulic data nameplate in accordance with NFPA 13.
- (3) Spare sprinkler heads shall be located in a spare head cabinet with sprinkler head wrench at an approved location by fire inspection personnel
- (4) Fire Department Inspection form from rough-in inspection must be on the job site at the time of test if there was a stipulation for rough-in approval
- (5) Activation of alarm notification appliances by flow test and tamper switch
- (6) Verify manufacturers head tolerance with the escutcheon in place and check for paint, obstructions, plaster, etc.
- (7) Labels for inspectors test, auxiliary control valves, etc. shall be in place
- (8) Dwelling unit identification and/or building diagram shall be in place at each riser

6.4.3.3 RE-INSPECTION FEES ADDED

A re-inspection fee may be assessed for each inspection or re-inspection, not limited to the following:

- (1) When installation is not complete.
- (2) When corrections from previous inspection are not complete.
- (3) When two or more appointments have been cancelled at the same address.
- (4) Late notice of cancellation. (less than 2 hrs prior)

6.4.7 CPVC CERTIFICATION *ADDED*

When installing CPVC piping, the factory issued certification card must be carried by the pipe fitter during installation and is to be made available to an inspector upon request.

6.5.2.1 SOLVENT CEMENT *ADDED*

The head adaptor/drop nipple assembly shall be pre-fabricated prior to installation to ensure the sprinkler orifice remains free of obstructions.

6.6.1.1 FIRELINE *ADDED*

A separate fireline shall be required to supply each fire riser assembly. The hydraulic calculations shall determine the pipe size.

6.7.1.6 BACKFLOW *AMENDED*

All fire sprinkler risers shall incorporate a UL listed or FM approved vertical double check backflow preventer.

6.7.1.7 TAMPERED CONTROL VALVE & FLOW SWITCH *ADDED*

A separate tampered control valve shall be required for each floor. The tampered control valve shall ring the bell when sprinkler monitoring or a fire alarm system is not required.

A separate tampered control valve and flow switch shall be required for each floor when sprinkler monitoring or a fire alarm system is required. Tampered control valves shall be zoned separately for each building and floor.

Exception: When a single dwelling unit occupies multiple floors, separate tampered control valves and flow switches may not be required. Written approval from the fire code official shall be obtained for this exception.

6.7.3.5 INSPECTORS' TEST VALVE *ADDED*

- (1) When a flow switch is required for per floor, each sprinkler system shall have an inspector's test valve and drain connected at the highest most remote possible point in the system for one & two floor occupancies.
- (2) When a flow switch is required per floor for 3 or more floors, the inspectors test connection shall be made at the individual floor remote area and connected into a common drain to allow separate testing of each floor.
- (3) Piping to the test valve will be the same size as piping to the most remote sprinkler head.

6.7.4.1 FIRE DEPARTMENT CONNECTIONS *AMENDED*

A fire department connection (FDC) shall be installed in an accessible location approved by the fire code official from a fire access road or driveway. The FDC shall be located directly beneath the alarm bell.

6.7.4.2 FIRE DEPARTMENT CONNECTIONS *AMENDED*

Fire department connections shall be at least 1-1/2 inches; National Standard (Male) Thread.

6.7.8.4 ALARMS *AMENDED*

Where a building fire alarm or sprinkler monitoring system is provided, the building fire sprinkler system shall be required to be zoned per floor.

6.7.8.5 ALARMS *ADDED*

Local water flow alarms shall be provided on all sprinkler systems as follows:

- (1) A 110 volt AC 6 inch minimum size electric bell
- (2) The bell shall be mounted on the exterior of the structure, facing the street and mounted directly above the F.D.C.
- (3) The bell must be at a height to view easily from the street or drive and no higher than the plane made by the bottom of the eaves
- (4) The alarm shall receive its' signal from a UL listed local water flow switch
- (5) Color: Red

6.7.8.6 MONITORING *ADDED*

Monitoring of the fire sprinkler system shall be required in buildings that have 100 or more sprinkler heads installed.

6.8.3.2 DESIGN CRITERIA – GARAGES *AMENDED*

Garages that are accessible by people by more than one dwelling unit, and are not covered by 6.8.3.1, shall be considered part of the building and shall be protected in accordance with 6.8.2. Garage doors shall be considered obstructions and shall not be permitted to be ignored for placement and calculation of sprinklers.

6.8.3.3 DESIGN CRITERIA – GARAGES *AMENDED*

Garages that are accessible only from a single dwelling unit shall be considered as part of that dwelling unit. Such garages shall be sprinklered with residential sprinklers in accordance with 6.8.1 or quick-response sprinklers designed to provide a density of 0.05 gpm/ft² (2.04 mm/min) over the area of the garage, but not to exceed four sprinklers. Garage doors shall be considered obstructions and shall not be permitted to be ignored for placement and calculation of sprinklers.

6.8.5 FLOW SWITCH LOSS *ADDED*

Pipe sizes 2" or less shall include 3 PSI fixed loss for the flow switch, or per manufacturer specifications.

6.8.6 PRESSURE SAFETY MARGIN *ADDED*

- (1) Calculations shall maintain a 10% pressure safety margin from the field water pressure tests.
- (2) The pressure used for hydraulic calculations shall not exceed 72 psi.
- (3) When additional fittings have been installed in a sprinkler system not accounted for in the design, revised drawings may be required with new calculations.

6.9.1 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall be installed in all areas except where omission is permitted by 6.9.3 & 6.9.6 as amended.

6.9.5 LOCATION OF SPRINKLERS *AMENDED*

Sprinklers shall be required on porches, balconies & corridors.
Exception: Sprinklers may be omitted from non-combustible porches, balconies, 48" or less in width.

6.9.6 LOCATION OF SPRINKLERS *AMENDED*

Attics shall be deleted from the omissions.

6.9.6.1 LOCATION OF SPRINKLERS *ADDED*

Attics shall be provided with sprinkler protection in accordance with NFPA 13; hydraulically calculated area of 900 sq. feet. Copper or steel sprig-ups are permitted off CPVC in 13-R installations where attic protection is not otherwise required by other codes or standards. CPVC sprig-ups are not permitted.

INTERPRETATIONS & APPLICATIONS
OF THE 2007 NFPA 72 Revised: 09-01-07



CHAPTER 1 – ADMINISTRATIVE

1.1.3 SPECIAL REQUIREMENTS BASED ON OCCUPANCY **ADDED**

The following special requirements shall apply based on the occupancy of the building.

GROUP E OCCUPANCIES

When a fire alarm system is required, automatic detection shall be provided throughout all useable areas. Automatic detection shall be provided by smoke detectors, except that in areas where ambient conditions prevent the use of smoke detectors (bathrooms, storage closets without electrical panels), heat detectors or fire sprinklers protecting such area may be used to automatically initiate alarm signals.

Fire alarm circuits shall be designed and installed in such a manner that the failure, removal, or destruction of any single alarm actuating or indicating device, or a break in the wiring circuit will not interfere with the normal operation of any actuating or indicating device (class “A” wiring).

GROUP I OCCUPANCIES

Notification appliances shall be chime/strobes throughout patient areas. Fire alarm circuits shall be designed and installed in such a manner that the failure, removal, or destruction of any single alarm actuating or indicating device or a break in the wiring circuit will not interfere with the normal operation of any actuating or indicating device (class “A” wiring).

GROUP S OCCUPANCIES

An automatic fire alarm system is required in enclosed (as defined by the International Building Code) parking garages. Due to the type of construction in parking garages, special consideration may be given when evaluating adequate placement of notification appliances to meet the adopted codes and standards. At the designer’s option, the number of audible devices may be reduced by 50% of the standard number used in occupied spaces.

1.1.4 ALARM INSTALLATIONS IN SEPARATED/NON-SEPARATED USES ADDED

Fire alarms shall be extended throughout all portions of contiguous buildings as required by the International Building Code Section 508.3. per the applicable separated and nonseparated uses construction requirements.

1.1.5 INTERIOR TENANT NOTIFICATION ADDED

Interior Tenant Notification shall be required when monitoring of the fire sprinkler system is provided. This requirement applies if this is the 1st T.I. in this building or if other suites in this building have Interior Notification. (Group R occupancies are exempt from this requirement.) Dedicated function fire alarm control units installed to provide monitoring of fire sprinkler systems shall provide a minimum of 5 zones.

For shell buildings, one (1) horn-strobe shall be installed and operational within the interior space prior to final.

Multi-story buildings shall require a minimum of 1 Horn-Strobe per level.

For Tenant Improvements (Shell build-outs): Install 1 horn-strobe above the main door or within 3 ft. of the main door for individual tenants. When a common area is provided serving multiple tenants, install 1 horn-strobe in the common area above the main door or within 3 ft. of the main door (these requirements shall also apply to spaces commonly referred to as “vanilla” or “white” shell tenant spaces at time of shell final).

Note: These requirements may be increased based on occupancy type or at the discretion of the Fire Code Official.

This is not intended to be an ADA compliant system. (Reference: Scottsdale Revised Codes, sec. 903.4.2)

CHAPTER 4 – FUNDAMENTALS OF FIRE ALARM SYSTEMS

4.5.1.1.1 SUBMITTAL REQUIREMENTS ADDED

All plan submittals shall comply with the revised 2006 International Fire Code 901.2.2. Provide 3 sets of plans and 1 set of manufacturer's data sheets. All plan submittals logged into the One-Stop-Shop for review shall be in accordance with the standard plan review format as provided by the Arizona Automatic Fire Alarm Association. Acceptable paper size shall be limited to 24 x 36 or 30 x 42 at 1/8" scale. Up to five devices/appliances may be submitted to one stop shop on an 8½ x 11 paper document.

For digital submittals see the City of Scottsdale Web Site at:

<http://www.scottsdaleaz.gov/bldgresources/digital.asp>

Approved plans shall be available on the job site before any equipment is installed or remodeled.

An approved set of alarm plans shall be on the job site at all times and shall be at the structure or part of the structure being tested or inspected. There may be no partial submittals.

CHAPTER 5 – INITIATING DEVICES

5.13.1.1 MANUAL FIRE ALARM BOXES **ADDED**

Manual Fire alarm boxes shall be installed in H, and I occupancies as required by the 2006 International Fire Code. All other occupancies shall not have manual fire alarm boxes installed except as required by NFPA 72 6.8.5.1.2.

For Educational occupancies, the manual fire alarm box shall be located in a constantly attended location such as the administration office.

5.16.5.9 LOCATION AND INSTALLATION OF DETECTORS IN AIR DUCT SYSTEMS **AMENDED**

Where required by 5.16.5.8, remote alarm or supervisory indicators shall be installed in an accessible location and shall be clearly labeled to indicate both their function and the air-handling unit(s) associated with the detector.

5.16.5.10 DUCT SMOKE DETECTOR TESTING **ADDED**

- (1) Duct smoke detectors in buildings with a building fire alarm system (full evacuation type system) or detectors being monitored offsite will be inspected by the site fire inspector.
- (2) Such new installations of smoke detectors associated with smoke dampers and HVAC shut-offs shall be tested by the professional engineer of record, an approved testing agency or a qualified third party special inspector.
- (3) The testing agency or qualified third party special inspector shall be an approved independent third party individual or firm and shall not be the installing contractor.
- (4) The final report submitted to the fire inspector shall be signed, sealed (wet) and dated prior to certificate of occupancy.
- (5) Duct smoke detectors in buildings without a building fire alarm system (full evacuation type system) will be inspected by the site building inspector. The provisions of items 2 and 3 above shall apply.

6.8.5.5.1.1 SPRINKLER WATERFLOW MONITORING PANELS **ADDED**

In buildings not required by the amended 2006 IFC to have fire alarm systems installed, or where voluntary fire alarm systems are not installed, dedicated function fire alarm control units (waterflow monitoring) are not required to have additional devices added or monitored by such units (duct detectors, smoke detector above panel, single pull station, etc) See 2007 NFPA 72 Handbook 6.8.5.5.1.

All alternative suppressions systems (hood suppression, clean agent systems, etc) shall be monitored offsite when waterflow monitoring systems are required or provided.

In buildings where fire alarm systems are installed, all applicable alarm system devices shall installed, supervised, and/or monitored by such system in accordance with this standard and applicable codes.

6.8.5.5.1.2 FLOW SWITCH ALARM MONITORING *ADDED*

Where flow switches on fire sprinkler systems are required to be monitored, they shall be connected to the fire alarm control panel & indicate floor and/or area/zone.

6.8.5.6.3 SUPERVISORY SIGNAL INITIATION – TAMPER *ADDED*

Control valves on fire sprinkler systems that are required to be monitored shall be connected to the fire alarm control panel & indicate floor and/or area.

6.16.3.10 ELEVATOR RECALL FOR FIREFIGHTER’S SERVICE *AMENDED*

Detectors used to initiate elevator recall service shall initiate a supervisory signal unless otherwise required by the State of Arizona Elevator Inspection Department.