CRR POLICY 1339: CRITERIA REQUIRING THE INSTALLATION OF NFPA 13D AUTOMATIC FIRE SPRINKLER SYSTEMS IN 1 & 2 FAMILY DWELLINGS

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Community Risk Management Division – 928-204-8926

This policy is promulgated in accordance with Section 104.1 of the 2012 International Fire Code (IFC).

This policy pertains to the criteria which trigger the installation of NFPA 13D automatic fire sprinkler systems in 1 & 2 family dwellings. Please refer to CRR Policy 1319 for information on building additions which require the installation of automatic fire sprinkler systems throughout in occupancies other than 1 & 2 family dwellings.

Sedona Fire District adopted policies requiring the installation of NFPA 13D automatic fire sprinkler systems in some 1 & 2 family dwellings in the early 2000's. This interpretation seeks to define how those criteria are applied to obtain that objective.

There are 12 different criteria that are applied to new construction projects and 1 criteria that pertains to existing structures. The Fire Code as adopted by Sedona Fire District states:

> **Section 903.2.6 [2003 SFC] Building Additions.** All additions to existing buildings or structures and all buildings or structures that are expanded by an addition(s) shall be provided with an automatic fire protection system complying with Section 903.3 as applicable.
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> **Exceptions:**
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> 1. Existing non-sprinklered one and two family dwelling units and R-3 occupancies complying with the Sedona Residential Code, but not including residential care facilities, having a gross floor area less than 3,600 square feet including the addition.
> 2. An existing non-sprinklered building or structure and additions to such existing building, provided the occupancy of the existing building is not changed, the addition is the same occupancy, and the resultant gross area of all such additions and building do not exceed 3,600 square feet.

> **903.3 [2003 SFC] Group R Division 3 Occupancies**. All Group R Division 3 occupancies shall be equipped with a residential style automatic fire sprinkler system installed in accordance with the National Fire Protection Association's Standard #13D when any of the following conditions are present.
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> 1. The building has a gross floor area greater than 3,600 square feet (344.5 m^2)
> 2. The building is more than 500 feet (152.4 m) from a fire hydrant capable of producing the required fire flow
> 3. The required fire flow is not available through approved means
> 4. Fire apparatus access roadways are obstructed by any of the following:
>   a. Low water crossing(s)
>   b. Security gate(s)
>   c. Speed bump(s)
> 5. The building is located in a sub-division having a single fire apparatus access point
> 6. The fire apparatus access roadway has a grade greater than 12%
> 7. The building is located more than five road miles (8.04km) from the nearest fire station on an approved route as measured by the Fire Marshal
> 8. The building is located on a cul-de-sac which exceeds 1000 feet (304.8m) from the nearest thoroughfare's intersection
> 9. The building is located more than 150 feet (45.72m) from the closest point of fire apparatus access
> 10. The building is located within the established urban-wildland interface area.

Section 903.2.6 deals with additions to existing buildings. This section is clear that all additions to existing buildings or structures and all buildings or structures that are expanded by additions shall have the appropriate automatic fire sprinkler system installed throughout both the existing structure and the addition, with two exceptions. None of the 13 criteria set forth under Section 903.3 have any bearing on existing buildings that are expanded by an addition.

Exception #1 exempts all non-sprinklered R-3 occupancies where the resultant gross floor area of the structure, and addition is less than 3600 square feet, and the occupancy is not a residential care facility, from this requirement.

Exception #2 exempts all non-sprinklered buildings or structures where the resultant gross floor area of the structure and addition is less than 3600 square feet, and the occupancy type of the addition is the same as that of the existing building, and the occupancy type of the structure will remain unchanged, from this requirement.

Section 903.3 sets forth the 13 criteria that will trigger the requirement that an NFPA 13D automatic fire sprinkler system be installed in newly constructed 1 & 2 family dwellings. If any one of these 13 criteria are met, it is required to install the automatic fire sprinkler system in the dwelling.

Criteria #1 - The building has a gross floor area greater than 3,600 square feet (344.5 m2): The gross floor area definition from the International Building Code is used to determine if a dwelling meets this criteria. Any dwelling where the gross floor area is greater or equal to 3600.01 square feet is considered meet this criterion.

Criteria #2 - The building is more than 500 feet (152.4 m) from a fire hydrant capable of producing the required fire flow: Although Appendix B105.1 states that the required fire flow for 1 & 2 family dwellings is 1000 gallons per minute, Criteria #2 has been historically been interpreted by previous Fire Marshals (including the current Fire Marshal) to be 500 gpm. This interpretation has primarily been based on one factor. That factor is that there has been a change in the methodology, over the years, as to how fire hydrants in the fire district are flow tested. It used to be that the actual flow during the test was measured and not what the hydrant was capable of flowing at 20 psi of residual pressure. This has resulted in an increase of between what hydrants have historically been reported to flow, and what they are actually capable of flowing. Essentially, if the proposed dwelling is located more than 500-feet away from the nearest orange bonnet, green bonnet, or blue bonnet hydrant, this criterion is met.

Criteria #3 - The required fire flow is not available through approved means: If an approved means to supply the required fire flow cannot be provided, this criterion is met.

Criteria #4A, #4B, & #4C - Fire apparatus access roadways are obstructed by; low water crossing(s); security gate(s); or speed bump(s): The intent of these three criteria is to require the installation of sprinklers when a condition exists that could slow or prevent the response of emergency apparatus. In some cases it may be possible to reach a dwelling by taking a longer route to the dwelling to bypass any of the obstructions listed above, which also delays the response. Taking a longer route to bypass an existing delay is not considered a viable means of maintaining or shortening the response and therefore cannot be considered to serve as a reasonable solution to consider this criteria as not being met. It is therefore, the interpretation of this office that, much like Criteria #10, any route which bypasses the obstruction must be approved by the Fire Marshal and be considered to not extend the response time to the dwelling. Any dwelling where the approved route, as determined by the Fire Marshal, includes the need to pass through a gate, or low water crossing, or over a speed bump(s) shall be determined to meet one of these three criteria.

Criteria #5 - The building is located in a sub-division having a single fire apparatus access point: Neither the Fire Code, nor the Building Code define *sub-division.* While the Merriam-Webster Dictionary defines it as *a tract of land surveyed and divided into lots for purposes of sale especially : one with houses built on it,* that definition does not provide a minimum number of lots to be considered a sub-division. Arizona Revised Statutes § 9-463.02 defines it as *improved or unimproved land or lands divided for the purpose of financing, sale or lease, whether immediate or future, into four or more lots, tracts or parcels of land.* Therefore, any dwelling served by a single fire apparatus access road that also serves three or more additional dwellings without a secondary means of fire apparatus access that is not blocked by low water

crossings, security gates, speed bumps or other means that would serve to delay emergency responses shall be considered to meet this criterion. It is worth noting that the single point of access need not occur in proximity to the structure. Sedona Fire District has large areas of our response district that are considered to be single points of access such as all properties located north of Dry Creek Rd. and accessed off of SR 89A where a blockage at that particular intersection prohibits passage of all emergency apparatus with no alternate route of access available that would not cause unacceptable delays; such as responding from the village through Sedona Ranch or Page Springs.

Criteria #6 - The fire apparatus access roadway has a grade greater than 12%: Steep grades slow the response of emergency apparatus by forcing them to downshift to negotiate the grade. Furthermore, it is more likely that steep grades may become impassable during snow or ice storms or during times of heavy rains, if water and debris wash down the roadway. Any dwelling located on a fire apparatus access road where any portion of the fire apparatus road exceeds a 12% grade, shall meet this criterion.

Criteria #7 - The building is located more than five road miles (8.04km) from the nearest fire station on an approved route as measured by the Fire Marshal: The intent of this criteria is to address the fact that the further away a dwelling is from the responding units, the longer the response will take. Like the example in Criteria #4C, routes must be approved by the Fire Marshal, and while this criteria does not specifically state it, only staffed fire stations can be considered as part of the *approved* route, as non-staffed or non-equipped fire stations also cause responses to be delayed. Furthermore, in some instances it may be possible to take a route shorter than the 5-miles which also take more time to negotiate due to grade, curves, or other issues which slow the response. Approved routes are at the sole discretion of the Fire Marshal as it pertains to this criteria. Any dwelling located more than five road miles from the nearest staffed fire station that is equipped with fire suppression apparatus capable of operating at a structure fire is considered to meet this criterion.

Criteria #8 - The building is located on a cul-de-sac which exceeds 1000 feet (304.8m) from the nearest thoroughfare's intersection: Again we find no definition of cul-de-sac or thoroughfare in either the Fire Code or Building Code and we must turn to the Merriam-Webster Dictionary. Cul-de-sac is defined *as a street or passage closed at one end*, and thoroughfare is defined as *a street open at both ends: a main road: the conditions necessary for passing through.* By these definitions, any dead end is considered to be a cul-de-sac; and this office chooses to interpret a thoroughfare as any street where it is possible to travel in either direction and find a means of egress. This criterion is determined to be met by any dwelling on a dead end road or other area with no outlet, where the distance from that dwelling to a thoroughfare where you can travel in either direction to a point of egress is measured at greater than 1000-feet.

Criteria #9 - The building is located more than 150 feet (45.72m) from the closest point of fire apparatus access: Section 503.1.1 of the International Fire Code, 2012 edition requires that all buildings be provided with fire apparatus access within all points of the building. One exception that 503.1.1 allows if that access cannot be provided is that the building must be equipped throughout with an automatic fire sprinkler system. This criterion codifies that requirement as part of the sprinkler system requirements for R-3 occupancies. Any 1 or 2 family dwelling where apparatus access to within 150-feet of the dwelling cannot be provided shall be determined to meet this criterion.

Criteria #10 - The building is located within the established urban-wildland interface area: Sedona Fire District has adopted the International Wildland-Urban Interface Code and as part of that adoption process has defined certain areas of the district that are considered to be Wildland-Urban Interface (WUI) areas. With very few exceptions, one of the requirements of that code is that all buildings or structures be equipped with automatic fire sprinkler systems

throughout. This criterion codifies that requirement as part of the sprinkler system requirements for R-3 occupancies. Any dwelling in determined to be within the WUI as established by Sedona Fire District meets this criterion.

Any comments or questions regarding the above information may be submitted to:
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