

THE UNIVERSITY of TENNESSEE 
INSTITUTE for PUBLIC SERVICE

MUNICIPAL TECHNICAL ADVISORY SERVICE

Chief Smokey Sparks
Anytown Fire Department
123 Main Street
Firesafe, Tennessee 12345-6789

June 19, 2013

Dear Chief Sparks,

Developers in your community have proposed a sub-division with several large homes and a private urban development (PUD) with zero-lot-line homes, and you indicate that your water system cannot supply the required fire flows for these risks. Your concerns about having sufficient water available for fire protection are valid, as the consequences of insufficient fire flows are significant, and include increased risk to trapped occupants in rescue operations, a reduced ability to extinguish the fire, an increase in property damage, and increased risk to firefighters.

An option for your community is passing an ordinance requiring residential fire sprinklers. The revised Insurance Services Office (ISO) Fire Suppression Rating Schedule (FSRS) takes effect in Tennessee on July 1, 2013. The new ISO Fire Suppression Rating Schedule has increased fire flow requirements for large homes (homes exceeding 4,800 square feet), but recognizes sprinklers and reduces the needed fire flow (NFF) accordingly (see Section 340 from the FSRS copied below). Under the "old" schedule, the NFF for a dwelling never exceeded 1,500 gpm. Under the revised schedule, dwellings exceeding 4,800 square feet will be evaluated for NFF the same as a commercial building. This makes sprinklers a good alternative to larger water mains and/or increased water storage capacity for large home sub-divisions or homes in zero-lot-line developments.

Section 340 – Calculation of Needed Fire Flow (NFF):

Use the following formula to determine the Needed Fire Flow (NFF):

$$\text{NFF} = (C)(0)[1.0 + (X + P)]$$

When a wood shingle roof covering on the subject building, or on exposed buildings, can contribute to spreading fires, add 500 gpm to the Needed Fire Flow.

The minimum Needed Fire Flow is 500 gpm, and the maximum is 12,000 gpm.

Chief Smokey Sparks
June 19, 2013
Page 2

Round the calculated Needed Fire Flow to the nearest 250 gpm if less than 2,500 gpm and to the nearest 500 gpm if greater than 2,500 gpm.

For residential occupancies** protected with an automatic fire sprinkler system installed in accordance with the general criteria of NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and including Four Stories in Height, the Needed Fire Flow is either the demand at the base of the automatic sprinkler riser or 1,000 gpm at 20 psi for a duration of 2 hours, whichever is greater.

For 1- and 2-family dwellings not exceeding 2 stories in height, the following Needed Fire Flows at a duration of 1 hour shall be used:

DISTANCE BETWEEN BUILDINGS	NEEDED FIRE FLOW
More than 30 feet	500 gpm
21-30 feet	750 gpm
11-20 feet	1,000 gpm
0 –10 feet	1,500 gpm

Exception 1: For a 1- or 2-family dwelling protected with an automatic fire sprinkler system installed in accordance with the general criteria of NFPA 13D, Installation of Sprinkler Systems for One- and Two-Family Dwellings and Manufactured Homes, the Needed Fire Flow is either demand at the base of the automatic sprinkler riser or 500 gpm at 20 psi for a duration of 1 hour, whichever is greater.

Exception 2: For a 1- or 2-family dwelling with an Effective Area greater than 4,800 square feet, calculate the Needed Fire Flow using the Needed Fire Flow formula in this Section. Use the duration as specified in Section 604.

** Residential occupancies specified in the scope of this standard include: apartment buildings; lodging and rooming houses; board and care facilities; and hotels, motels, and dormitories.

Residential fire sprinklers will provide the fire protection needed for these developments.

Sincerely,



Dennis Wolf
Fire Management Consultant
UT-MTAS