DETERMINING NEEDED WATER SUPPLY

SCOPE

This guideline shall apply to all members of the Stoney Point Fire Department (SPFD) and shall be adhered to by all members. Fire flow requirements are a critical aspect of any active fire ground operation. It is imperative that all SPFD Fire Officers & Engineers be familiar with the National Fire Academy Fire Flow Formula in determining needed water supply for active fire ground operations.

PURPOSE

The purpose of this SOG is to establish guidelines in the utilization of National Fire Academy's (NFA) Fire Flow Formula (FFF) to calculate needed water supply for active burning structures. These calculations will be used as a vital part of the overall strategic incident plan to accomplish fire control.

Policy Number

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RESPONSIBILITY

It shall be the responsibility of initial Company Officer to calculate the length and width of a structure during his/her 360 safety walk-around to determine needed water supply, using the National Fire Academy Fire Flow Formula. Calculations may not be necessary if the structure has been previously pre-planned and the information is available to the officer.

DEFINITIONS

Calculation - a mathematical determination of the size or number of something.

Exterior Exposure – any adjacent structures exposed to fire.

Interior Exposure – Any floors above a fire floor that are exposed to fire.

FFF - Fire Flow Formula

NFA - National Fire Academy

NFF – Needed fire flow

POLICY

The utilization of the NFA's Fire Flow Formula shall be the standard practice to all SPFD members in determining needed water supply during the pre-fire planning process and during active burning structures. Application of the appropriate flow rate is critical to accomplish fire control. The initial Company Officer will determine the length & width of a structure while

performing a 360 safety walk-around at all structure fires in order to calculate needed flow rates.

To determine needed water supply the following formula will calculated:

When conducting pre-fire plans the SPFD member shall measure the structure with a steal tape or roll wheel to determine the square footage. At actual incidents the officer should estimate the length and width of the structure to determine square footage, then multiply that number times the number floors. Once the square footage is determined divide the square footage by three. This calculation will give you the needed fire flow for 100% involvement. Using the NFA method, one floor is 35' x 100'. The equation will be (35'x100)/3=2333gpm for one floor. This number should always be rounded to the nearest 100 which would calculate to 2300gpm. If 2 floors are involved, multiply 2300gpm x 2 (2300gpm x2) =4600gpm. If only half of the structure is involved, multiply the total number by 50% (4600gpm x .50) =2300gmp or if a quarter of the structure is involved, multiply the total number by 75%. In this case, calculations would be (4600gpm x .75) =3450 rounded off would be 3500gpm. NFF= [(length x width)/3] x % of involvement.

$$\text{Needed Fire Flow} = \left(\frac{\text{Length x Width}}{3} \right) \text{x \% Involvement}$$

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DETERMINING NEEDED WATER SUPPLY FOR EXPOSURES

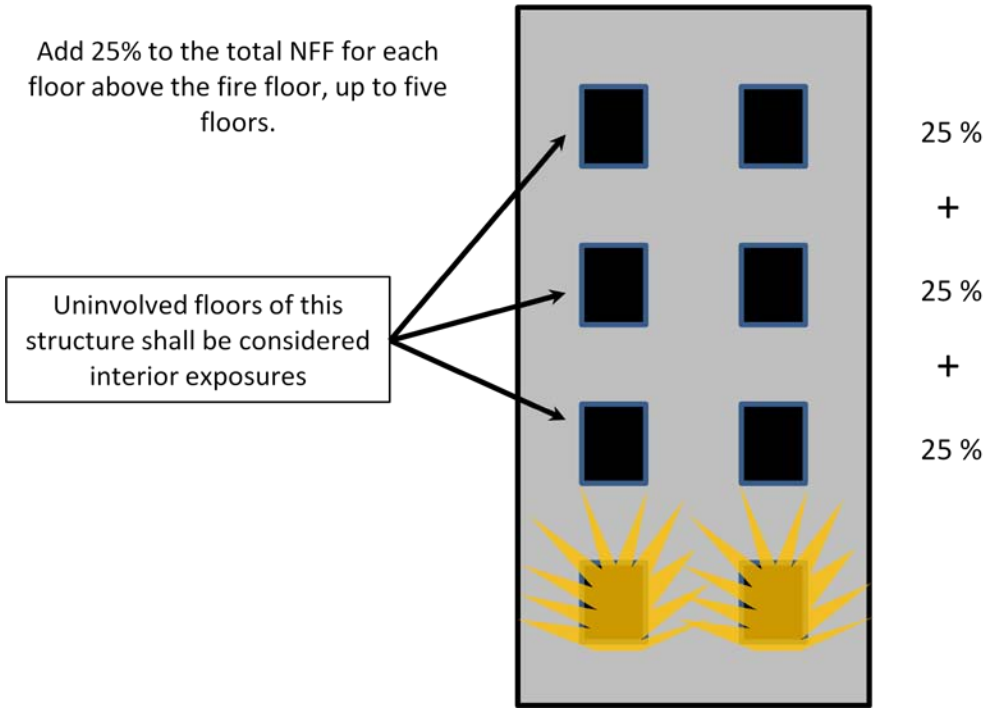
INTERIOR EXPOSURES

For the purpose of this SOG there are two types of exposures, interior and exterior. For interior exposures, add 25% of your NFF to each floor above the fire, not to exceed five floors. Exposure calculations would be (NFF x 25%) +each floor.

$$\text{Needed Fire Flow} = \left(\frac{\text{Length x Width}}{3} + \begin{array}{c}\text{Exposure Charge} \\ \text{25\% of the Basic Fire Flow per Exposure}\end{array} \right) \text{x \% Involvement}$$

Using the above example of NFF=4600gpm, you would calculate NFF for exposures by multiplying 4600gpm x .25 (25%) =1150gpm, rounded off would be 1200gpm. Take this calculation and add it to the original NFF for each floor above the fire.

Interior Exposures



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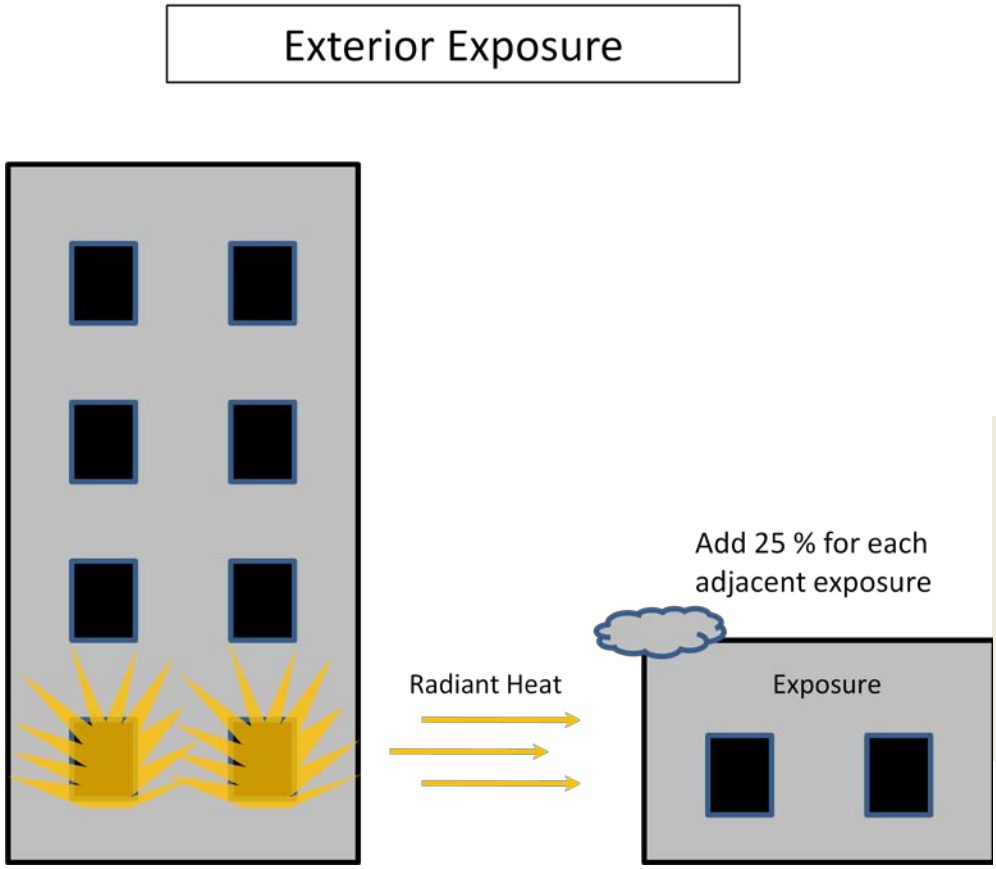
$$\text{Needed Fire Flow} = \left(\frac{\text{Length x Width}}{3} + \text{Exposure Charge (25\% of the Basic Fire Flow per Exposure)} \right) \text{x \% Involvement}$$

EXTERIOR EXPOSURES

For exterior exposures, add 25% for each adjacent structure that is exposed to fire within 100 feet. Exposure calculations would be (NFF x 25%) +each exposure.

$$\text{Needed Fire Flow} = \left(\frac{\text{Length x Width}}{3} + \text{Exposure Charge (25\% of the Basic Fire Flow per Exposure)} \right) \text{x \% Involvement}$$

Using the above example of NFF=4600gpm, you would calculate NFF for exposures by multiplying 4600gpm x .25 (25%) =1150gpm, rounded off would be 1200gpm. Take this calculation and add it to the original NFF for each exposed structure to give you the total NFF.



Once the initial company officer determines the needed water supply, he or she will relay this information to the Engineer and whomever is the Incident Commander. This information will be used strategically and tactically to accomplish the overall goal of fire control.