

Hiawatha Fire & Rescue

Policy 602
Emergency Operations
Water Supply
5/25/2001

I. Scope

This policy establishes the requirement that an adequate and reliable water supply be established at each incident.

II. General

- A. For firefighting efforts to be effective, an adequate and reliable supply of water must be available. The adequacy of potential sources of water are constantly changing due to the weather, system demands, and many other factors beyond the department's control.
- B. Each member shall be aware of the potential fire flow demands within the fire district and shall identify available options for developing a sufficient volume of water to adequately combat any fire that might occur.

III. Responsibilities

- A. The fire chief shall appoint a member to serve as the water supply officer for the department.
- B. The water supply officer shall:
 1. Serve as a liaison with the water department.
 2. Furnish an accurate and up-to-date hydrant map of the fire district.
 3. Maintain a complete and up-to-date water supply map at the fire station.
 4. Identify areas where additional fire hydrants may be needed and make recommendations to the chief to have additional hydrants installed.
 5. Provide the station with a complete and accurate map of all static water sources within the district.
 6. Maintain and distribute an up-to-date list of the hydrants that are out of service.

IV. Operational Procedures

- A. Each engine company shall be responsible for providing its own uninterrupted water supply on the fireground. The ability to do so will be predicated on:
 1. The required fire flow.
 2. The availability of water supply,
 3. The number personnel available.
 4. The numbers and types of apparatus available.
- B. Calculations of required fire flow:
 1. The following factors influence the required fire flow:
 - a. Construction type.
 - b. Contents.
 - c. Occupancy.
 - d. Exposures.
 - e. The presence or absence of extinguishing systems.
 2. For tactical purposes, the calculated analysis of the fire flow shall use the following Insurance Services Office (ISO) formula:
 $Q = 18 C (A)^{.05}$
Q = Needed fire flow in gallons per minute (gpm).
A = Total building area in square feet (ft²).
C = A factor based on construction as follows:
C = 1.5 for wood frame.
C = 1.0 for wood-joisted masonry.
C = 0.8 for unprotected noncombustible.
C = 0.6 for fire resistive
 3. For a quick reference during fireground operations, use the Nelson – Royer Formula for the required fire flow:

$$\text{Required Fire Flow} = \frac{H \times W \times L}{100}$$

H = Building Height
W = Building Width

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L = Building Length

Example: For a building that is 60 feet long and 40 feet wide with a 10 foot ceiling, the fire flow would be:

$$\text{gpm} = \frac{10 \times 40 \times 60}{100} = \frac{24,000}{100} = 240$$

To flow 240 gpm would require:

One 2 ½ - inch handline flowing 240 gpm or

Two 1 ¾ - inch handlines at 120 gpm each.

Note: The Nelson – Royer Formula should only be used for calculation when the ISO formula hasn't been computed as part of a pre – plan.

4. As a general rule of thumb, the following minimum flows are required:

Residential	500 gpm
Light Commercial	1,000 gpm
Heavy Commercial	1,500 gpm
Industrial	≥ 2000 gpm
 5. The required fire flow may be reduced by 50 percent if an automatic fire sprinkler system is present
- C. Water supplies may be established by:
1. Booster tank operations: For demands of less than 250 gpm or brief duration. Water may be transferred from another apparatus by 2 ½ inch lines. If more than 1,000 gallons are needed, use another source.
 2. Supply lines: A 4 or 5 inch line from a hydrant or static source via drafting. This is the most dependable source and should be used whenever possible. When in doubt, lay a line.
 3. Tanker shuttle: The use of water tankers to transport water in areas without hydrants. Tankers are available from:
 - Hiawatha Fire and Rescue
 - Monroe Township Fire Department
 - Palo Fire Department
 - Robins Fire Department
 - Cedar Rapids Fire Station #1
 - Marion Fire Station # 1
 - Atkins Fire Department
 - Shellsburg Fire Department
 - Center Point Fire Department
 - Alburnett Fire Department
 - Fairfax Fire DepartmentDuring a tanker shuttle:
 - 1.) Two members set up one or two port – a – tanks.
 - 2.) A tanker fills the port – a – tank.
 - 3.) A pumper can draw water from a port – a – tank even while it is being filled.
 - 4.) Once a tanker is empty, it can go for more water while the pumper continues to draw from the port – a – tank.