

Grand Forks Fire Department

Standard Operating Procedures

SOP# 603.03	Section Emergency Operations	Title Fire Streams
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I. Scope

This standard shall apply to all incidents where hoselines must be deployed and water is used to mitigate the situation. It was promulgated to:

- A. Establish guidelines for developing effective fire streams.
- B. Establish guidelines for the proper placement of fire streams at a fire control or rescue incident.

II. General

- A. Tactical success during firefighting operations depends to a large degree on the timely development and placement of adequate fire streams.
- B. For a fire stream to be adequate, sufficient pressures are needed to provide effective reach. Select hoselines and nozzles that provide sufficient volumes to meet fire flow demands.

III. Hoseline Selection

- A. Initial hoselines should be deployed based on the following:
 - 1. Hose of a sufficient size to meet the fire flow demand.
 - 2. The proper safety factor of personnel operating the line.
 - 3. Adequate personnel available to deploy the line effectively.
 - 4. Sufficient water supply to meet fire flow demand.
 - 5. The time required and work involved in deploying stream.

B. Stream comparisons:

1. Initial hose streams will commonly use preconnected lines of either 1-3/4 or 2-1/2 inch hoses.
2. 1-3/4 inch lines will normally be equipped with Task Force Mid-matics. At 100 psi, flows of 70 to 200 gpm are available.
3. 2-1/2 inch lines will normally have Task Force Automatic fog nozzles. At 100 psi, flows of 50 to 350 gpm are available.
4. Standpipe lines commonly have a high rise pack from an engine company of 200 ft. of 1-1/2 inch hose with AKRON Turbojet (set gallonage) nozzles of 60 to 195 gpm are available.
5. For defensive operations, smooth-bore 2-1/2 inch nozzles are carried on all engine companies. Tips of:

1 inch provides 210 gpm @ 50 psi.

1-1/8 inch provides 266 gpm @ 50 psi.

1-1/4 inch provides 328 gpm @ 50 psi.

6. Deck pipes have stacked tips and @ 80 psi are capable of delivering:

1-3/8-inch provides 502 gpm

1-1/2-inch provides 598 gpm

1-3/4-inch provides 814 gpm

2 inch provides 1063 gpm

7. Portable master stream devices are equipped with both straight tips and 500-gpm fog nozzles.
8. Taskforce Automatic Master fog nozzles provide 350 to 1,000 gpm @ 100 psi.

IV. Placement

A. Order of deployment:

1. Place the first line between the fire and the victims to provide an escape route.
2. If there is no life hazard, place the first line between the fire and the most severe exposure.
3. Place the second line to support the first line or to protect a secondary means of egress.
4. Use additional lines to support attack positions.

B. Rules of placement:

1. Always attack structure fires from the unburned side.
2. Attack wildland fires from the burned side.
3. Never combine interior and exterior attacks.

V. Defensive Fires/Exterior Attack

- A. Large fires require large volumes of water. Whenever possible, avoid using handlines and opt for portable monitors and deck pipes instead.
- B. The best results are normally obtained from smoothbore nozzles. They provide greater reach and penetration. Fog lines may be necessary in some cases to protect apparatus and personnel.
- C. Elevated streams:
 - 1. Use to protect exposures.
 - 2. Use through windows or other openings.
 - 3. Never use in vent holes. Directing an elevated stream through a properly made ventilation hole in a roof will negate the beneficial results of the vent. The stream will act as a cover that arrests ventilation drives fire to other areas, and often forces firefighters out of the building.
- D. The following table provides friction losses in elevating platforms.

Pressure Loss (psi) Due to Elevation						
Height of nozzle (feet)	55	65	75	85	90	125
Head loss-rule of thumb (5 pounds per 10 feet) Actual (.434 lbs. per foot)	27.5	32.5	37.5	42.5	45.0	62.5
	23.9	28.2	32.6	36.9	39.1	54.3
Pressure loss in 4" pipe (750 gpm)	22.0	22.0	22.0	22.0	22.0	22.0
Pressure loss in 4" pipe (1,000 gpm)	37.5	37.5	37.5	37.5	37.5	37.5
Total loss – 4" (thumb) (750 gpm) (actual)	49.5	54.5	59.5	64.5	67.0	84.5
	45.9	50.2	54.6	58.9	61.1	76.3
Total loss – 4" (thumb) (1,000 gpm) (actual)	65.0	70.0	75.0	80.0	82.5	100.0
	61.4	65.7	70.1	74.4	76.6	91.8