City of Bellevue

Public Information
Handout **F-74**

Fire Flow

September 2017

Fire-flow is the amount of water available for fire-fighting purposes. The amount of available water can influence the type of construction, fire-protection systems and potentially other mitigating measures.

The required fire-flow is based on appendix chapter B of the International Fire Code together with the area and type of construction of the structure. The available fire-flow is based on water system hydraulic conditions at the closest accessible fire hydrant within 400' of the structure (600' for Group R-3 and U occupancies that are equipped with fire sprinkler systems).

In some circumstances it is permissible to consider more than one hydrant provided that the additional hydrant(s) are within the distances noted above, however the available fire flows for multiple hydrants are not cumulative, since they typically pull from the same pipes and must be tested simultaneously.

Bellevue estimates available fire-flow using a calibrated, computer-based water model that constrains the output to a residual pressure of 20 p.s.i. and/or 10 feet/second velocity in the pipe. The model simulates normal low-pressure conditions (peak seasonal demands, low tank levels, pumps off, etc), which are not demonstrated during field tests.

To request fire-flow determination contact either: Utilities Department - 425.452.4187 or Fire Department - 425.452.4122

Hydrant Flow Test

In some cases, Bellevue may accommodate a request to perform an actual field flow test, to be paid for by the developer. To inquire about associated costs (typically this is at least several thousand dollars), contact Utilities Operations & Maintenance - 425-452-7840

Note: field tests only demonstrate normal conditions, which often are not appropriate for design.

Flow tests are not typically performed due to the requirements noted below. Fees are necessary to reimburse the City for this effort:

- Licensed operator who will conduct the flow test
- Impacts to nearby customers. Fire flow velocities create cloudy water, which could concern residential customers and may cause restaurants to close and lose revenue. Testing may only be allowed overnight and nearby customers must be notified in advance.
- Means to manage water:
  - Erosion control
  - Preventing sediment from entering waterways
  - Dechlorination
- Traffic management
- Post-test flushing until water quality returns to normal. This can take 2-3 hours.
- Estimating water volume to track system losses and bill for water use. Volume used in a single test could be 100,000 gallons or more
- Utilities staff over-time

Sprinkler System Design

Fire-flow data is also utilized for the design of automatic fire-sprinkler systems. Sprinkler system designs shall be designed with a buffer to account for water system fluctuations such as a low resevoir condition, maintenance work, and future system changes. Where a fire-flow data is used for the purposes of automatic fire sprinkler system design, the test shall be conducted no more than 12 months prior to working plan submittal. The required buffer is 5% for static pressures less than 50 p.s.i. and 10% for static pressures greater than 50 p.s.i. Buffers are not required for NFPA 13D systems. The fire sprinkler contractor is required to confirm field static pressure prior to:

- Prior to initiating sprinkler system design.
- Prior to installing any sprinkler piping, including the underground supply.
- Prior to requesting any cover inspections.